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U. S. DEPARTMENT OF AGRICULTURE,

FOREST SERVICE—BULLETIN No. 68.

GIFFORD PINCHOT, Forester.

A WORKING PLAN

FOR

FOREST LANDS IN CENTRAL ALABAMA.

BY

FRANKLIN W. REED,

FOREST ASSISTANT, FOREST SERVICE.

PROPERTY OF STATE FORESTER DEN. COLORADO

DEPARTMENT OF FORESTRY COLORADO AGRICULTURAL COLLEGE FORT COLLINS, COLORADO

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GIFFORD PINCHOT, *Forester.*

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U. S. DEPARTMENT OF AGRICULTURE,
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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
FOREST SERVICE,
Washington, D. C., July 24, 1905.

SIR: I have the honor to transmit herewith a manuscript entitled "A Working Plan for Forest Lands in Central Alabama," by Franklin W. Reed, Forest Assistant, Forest Service, and to recommend its publication as Bulletin No. 68 of the Forest Service.

The two maps and four plates accompanying the text are necessary for its proper illustration.

Very respectfully,

GIFFORD PINCHOT, *Forester.*

Hon. JAMES WILSON,
Secretary of Agriculture.

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The Coosa County tract.
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A WORKING PLAN FOR FOREST LANDS IN CENTRAL ALABAMA.

INTRODUCTION.

SITUATION OF THE TRACTS.

The working plan here presented was made by the Forest Service for two tracts of longleaf pine land in Alabama, both owned by the same lumber company. One tract is situated in the northwestern part of Coosa County, the other occupies the western end of Bibb County and portions of the adjacent counties of Tuscaloosa, Hale, and Perry.

The tracts are 60 miles distant from each other, and differ in geological formation, in topography, and in soil. The two forests, in consequence, present different silvical problems.

DESIRE OF THE OWNERS.

The lumber company desires to obtain a second crop of timber from its lands if it can do so within a reasonable length of time. At the present rate of cutting, the company will have worked over both its tracts in about twenty-five years. If it can count on having a second crop averaging 3,000 feet to the acre ready for the ax by the time it has finished marketing the present crop, the company is willing to modify its present logging methods to the extent of cutting to a diameter limit and avoiding injury to young growth. It is unwilling to incur expense in protecting its lands against fire, however, either for the purpose of improving the second crop or for that of hastening the production of a third.

PURPOSE OF THE WORKING PLAN.

The purpose of the accompanying working plan is to define for each tract a system of management which shall carry out to the best advantage the wishes of the owners in respect to the production of a second crop, and to discuss the advisability and possibility of producing a third.

CHARACTER OF SURVEY WORK DONE.

The preparatory field work, which occupied a party of nine men on the ground for a period of five months, consisted principally in the running of valuation surveys, the making of stem analyses, a study of the logging methods of the Kaul Lumber Company and their effect on the future productivity of the forest, and a study of the damage to the forest by fires and of means of preventing them. A total of 5,375 acres of valuation surveys were run—1,791 in the Coosa County tract and 3,584 in the Bibb County tract.

In addition to the field work a special study was made at the mill at Hollins to determine the value of the lumber sawed from trees of different sizes.

The volume table for longleaf pine, numerically and commercially the most important tree, is based upon measurements of 472 trees and ring counts of 526 stumps. For the loblolly pine, measurements of volume and rate of growth were obtained from 128 trees. As a means of comparison with the figures obtained from the measurements of felled timber, height measurements of standing trees were taken with a hypsometer in various parts of both tracts.

The map of the Coosa County tract is a combination of the field notes and township plats of the Public Land Survey, the topographic sheets of the U. S. Geological Survey, and the topographical notes from the valuation surveys made by the Forest Service. The map of the Bibb County tract is a combination of the Public Land Survey and the valuation survey notes.

The yield tables were compiled from the figures obtained from the valuation surveys and the stem analyses. Each tract was divided into blocks according to differences in character, composition, and condition of the forest. A stand table, giving the average number of trees per acre of each diameter class, was worked out for each block.

The tables of the present yield, giving the average per acre in board feet for each block, are combinations of the stand tables and the volume tables obtained from the stem analyses.

The tables of future yield were obtained by combining the tables of the stand, volume, and rate of growth.

It seemed best not to attempt to survey every acre owned by the company, nor to survey its lands only, since both its tracts are very much broken up by interior holdings, some of which contain good timber, and these the company expects gradually to buy up. To have surveyed those areas only to which the company at the present moment holds the title would have resulted in leaving out of consideration a great deal of land in which it has almost the same interest as in that which it actually owns, and would have made it impossible to compile anything but a very incomplete and dis-

connected forest map of the territory studied. Furthermore, the company owns many small, scattered plats of land, which are so isolated from the main bodies of its holdings as to make the surveying of them very expensive and impracticable. It was therefore deemed advisable to select as a basis for the working plan in each locality those townships or portions of townships in which the Kaul holdings predominate, and to survey and study them completely, regardless of ownership. This plan was carried out on both tracts.

THE COOSA COUNTY TRACT.

SITUATION.

The total area in Coosa County, surveyed in accordance with the field notes of the Public Land Survey, was 35,984 acres. It comprises wholly or in part sections 6, 7, 8, and 18 of township 24 north, range 18 east; sections 7 to 36, inclusive, of township 24 north, range 17 east, and sections 1 to 24, inclusive, of township 23 north, range 17 east.

These townships, which comprise the Coosa County tract, are located in what Dr. Charles Mohr designates as the region of metamorphic hills.[a] It is the extreme southern extension of the easternmost ranges of the Appalachian system, and occupies all of the country between the Coosa and Tallapoosa rivers.

TOPOGRAPHY.

The Coosa County tract has an area of 30,000 acres. The topographical features vary considerably, and are in some respects rather unusual. The general direction of the drainage is westward into the Coosa River, which, at the nearest point, is about 6 miles west of the west boundary of the tract.

The elevation above sea level varies from 500 feet at the lowest points on Peckerwood, Paint, and Clay creeks, to 1,150 feet at the summit of Weogufka Mountain. The general character of the country may be described as rolling. The ridges, as a rule, are low, broad, and rounded. In some places, however, they develop into steep-sided, well-defined hills, rising several hundred feet above the general level of the surrounding country.

The divide between the waters of Finnegotchkee and Clay creeks on the south and those of Peckerwood and Paint creeks on the north has an elevation of from 750 to 800 feet above the sea on the northern end, but it is so little raised above the general elevation of the surrounding country and slopes off so gradually on either side as to be scarcely noticeable as a main divide. Toward the south, however, it increases in altitude and sharpness of slope, with the result that it

[a] Dr. Charles Mohr: Plant Life of Alabama (Alabama Geological Survey).

becomes transformed into a range of high hills, rising 300 or 400 feet above the general level of the country and with an actual elevation above sea level at the highest point, York Mountain, of over 900 feet. (See Pl. I, fig. 1.) To the southwest of York Mountain is a range of hills called the Reedy Mountains.

South of this divide there is a broad strip of slightly rolling country—in some places almost level—and then another range of hills, considerably higher, steeper, and rougher than the last, which extend in a southwest to westerly direction across the southern part of the tract from section 12 to section 19 of township 22 north, range 17 east. The point of highest altitude, 1,150 feet, is Weogufka Mountain, on the eastern edge of section 15. This range of hills, although it is one of the highest in the county, does not form a divide. Weogufka Creek, the largest stream on the tract, and Finnegotchkee Creek, its main tributary from the north, force their way directly through the steepest and most elevated part of it.

The lower valleys of the other large creeks on the tract and the upper part of that of the Finnegotchkee are broad and level, but where the latter and Weogufka Creek cut through the hills they have each formed a deep, narrow, steep-sided gorge, containing practically no level land. (See Pl. I, fig. 2.)

SOIL.

The formation of the region is paleozoic, and the different degrees with which the various crystalline rocks resist erosion give rise to a wide variation in the mechanical and chemical properties of the soil. This is exemplified in the sterile, sandy soils formed from the siliceous slates and quartzites of the higher elevations and the fertile, stratified clay soils from gneissic rocks and clayey slates of the lower ones.

THE FOREST.

Although the Public Land Survey of Coosa County was made over sixty years ago and the settlement of the country was begun even earlier, yet of the 35,984 acres under consideration 88.3 per cent, or 31,774 acres, still remain under forest, which, with a few small exceptions, remained untouched by the ax until the advent of the lumber company.

Past Lumbering.

When the survey of the Coosa County tract was made by the Forest Service the company had clean cut all of section 6, and practically all of sections 7 and 8 in township 24 north, range 18 east, and was engaged in cutting to a diameter of 15 inches breasthigh in section 18 of township 24 north, range 18 east, and in sections 11, 12, 13, and 14 of township 24 north, range 17 east. Its logging camp was located in

the middle of section 12. Aside from this work, lumbering had been confined to the operations of four local mills. These mills had, in township 24 north, range 17 east, culled the large pine from the western half of section 16; cut the large pine from all the forties in section 26, except the five belonging to the company; and removed the largest and best trees from all of section 36, except the three forties belonging to the company. In township 23 north, range 17 east, they had removed the best trees from the greater part of sections 1 and 2, with the exception of the five forties belonging to the company.

In spite of the fact that lumbering has been so limited as to have practically no effect on the general composition of the forest, forestal conditions have indirectly been modified in other ways by human agency, and the forest can not properly be called virgin. Ever since the first settlers came into the country it has been used as a public range, and its constant utilization for the pasturage of cattle, sheep, and hogs, and the repeated annual ground fires, set for the purpose of improving the grazing, have resulted in changing considerably the character of the undergrowth and the ground cover, and in hindering or preventing entirely the reproduction of some of the tree species. The results of these influences will be discussed in detail later. At the time of the survey a lumber company, under lease from the Kaul Company, was preparing to box all the longleaf pine above 15 inches diameter in sections 23, 24, 25, 26, and 27 of township 24 north, range 17 east.

Forest Types.

The many variations in the soil and topography of the tract so influence the distribution of the tree species and the composition of the forest that it is possible to distinguish at least six different forest types. If the management of the tract were to be at all intensive it would be advisable to recognize these as distinct types and to treat each one separately, but under the very extensive system of management recommended it seems best to divide the forest into two main types only—the upland type or longleaf pine land and the bottom or creek land.

LONGLEAF PINE LAND.

The longleaf pine land occupies in all 27,805 acres of the tract—77.3 per cent of its total area and 87.5 per cent of that portion still remaining under forest. It covers all the slopes and tops of the ridges. Numerically, silviculturally, and commercially the longleaf pine is the most important tree. On by far the greater part of the type, where the soil is sandy, poor, and dry, it forms pure stands. In some cases there is a rather dense undergrowth of stunted and scrubby blackjack, Spanish, post, and scarlet oaks, hickories, dogwood, black gum, sourwood, etc., but more often the undergrowth is

lacking entirely or consists only of a few widely scattered individuals of the above species. In the latter case the ground cover consists of a mat of grasses and numerous species of the orders Compositæ and Leguminosæ. Where the underbrush is dense this herbaceous growth is replaced by a thin layer of hardwood leaf litter. In those localities where the soil is more fertile and retentive of moisture than that on the quartzite formation, the hardwoods attain a much larger development and often play an important part in the composition of the forest. Here the shortleaf and loblolly pines make their appearance and sometimes almost entirely crowd out the longleaf. The hardwoods also often predominate on the steep northern slopes of the higher elevations, the York and Reedy mountains, and the Weogufka range. In such localities the number of hardwood species is increased by the addition of the red and chestnut oaks. On the southern exposures the pure longleaf forest extends up the slopes and covers the tops of the ridges to an elevation of 1,000 feet above sea level. But above that altitude, on Weogufka Mountain, the hardwoods begin to creep in more and more, until on the top of the mountain the forest consists of a stand of stunted oaks and hickories, the pines being represented by only a few scattered shortleaf and one or two longleaf trees.

The occurrence of rhododendron and mountain laurel as undergrowth with the longleaf pine considerably alters the appearance of the forest. These growths are found mainly among the hills between the Finnegotchkee and Weogufka creeks, the former on the lower slopes of the cool northern exposures and the latter in small clumps on the steep, rocky, and dry southern exposures.

While the loblolly pine occurs only on the shale and schist soils and on the lower slopes along the edges of the creek type, where the soil is deep, fresh, and fertile, the shortleaf is found scattered sparingly over all parts of the type. It is less common on the rolling land than in the hilly country, where small groups of saplings or scattered individuals of mature size are sometimes found growing in the midst of an otherwise pure stand of longleaf.

The chestnut was formerly a common tree throughout the longleaf pine land, but during the last fifty years it has been dying out. At present the dead stubs are often found scattered among the pines, but sound living trees are extremely scarce. Only one perfect specimen was seen during the two months spent upon the tract.

Reproduction on the longleaf pine land is not good; that of the longleaf pine itself is poor, and where the stand of hardwoods is at all dense the reproduction of the pine is entirely prevented by the shade. In the open forest, where there is no underbrush, reproduction of longleaf pine has been kept out by the fires and hogs. There is, however, in some localities which have not been recently burned, an abundance of 2-year-old seedlings, the result of the last heavy seed year, but

they are sure to be destroyed the next time fire runs over the ground. Seedlings or saplings above 2 years of age are rare, and confined to small isolated groups, which, by some favorable circumstance, managed to escape fire for four or five years.

The reproduction of shortleaf and loblolly, in proportion to the representation of these species on the type, is much better than that of longleaf, but is confined mainly to the shale and schist soils or to the old fields where fires have been less frequent than in the pure longleaf stands.

CREEK LAND.

The creek land occupies 3,967 acres, 11 per cent of the whole tract, or 12.5 per cent of the forested area. It covers the bottoms of the valleys and sometimes reaches a short distance up the lower slopes. On the broad, level alluvial bottomlands in the lower valleys of the larger creeks it is often over a quarter of a mile wide, but on ascending the creeks it becomes gradually narrower, until along the smaller branches it dwindles down to a width of not over one or two chains. The soil is deep, well watered, and enriched by the wash from the slopes. It supports a comparatively large number of species, the hardwoods greatly predominating over the pines. Of the former the following were noted: White oak, cow oak, post oak, chestnut oak, black oak, Spanish oak, red oak, willow oak, water oak, three or four species of hickory, beech, ash, yellow poplar (tulip tree), black gum, red gum, two or three species of magnolia, dogwood, sourwood, red and sugar maple, blue beech, a species of elm, basswood, holly, hornbeam, and river birch. The last two are found only in the deep, narrow gorges of Weogufka and Finnegotchkee creeks in the southeastern part of the tract. The red and chestnut oaks are found in the narrow strips along the small branches flowing out of the hills. The other species are fairly well distributed throughout the type.

Of the pines the loblolly is the representative species. The larger trees nowhere form pure stands, but occur scattered singly or in small groups of three or four trees among the hardwoods. They reach their best development on the broad, level land of the lower valleys, where trees over 3 feet in diameter are not uncommon. The shortleaf pine is found mainly along the edges of the type, where it merges into the longleaf pine land. The proportion of the shortleaf is insignificant, and the great majority of the hardwoods are too small to furnish saw timber. Longleaf pine is almost entirely absent.

Underbrush is usually dense. It consists sometimes, but rarely, of thickets of sweet illicium (stink bay), and sometimes of canebrakes, but more often it is a mixture of various species of deciduous shrubs and small saplings of the hardwood species mentioned above. The ground cover, owing to the density of the forest and the consequent lack of

light, is generally a layer of leaf litter. Reproduction of loblolly pine occurs occasionally in small groups in openings among the hardwoods.

Creek land, as compared with the longleaf pine land, both in area and in yield per acre of merchantable timber, is unimportant.

UNWOODED LAND.

Of the whole tract 4,212 acres, or 11.7 per cent, is cleared and is or has been recently under cultivation. As the map shows, this cleared land is scattered over the tract in patches varying in size from 2 or 3 to 200 or 300 acres. Most of the 58 sections surveyed contain at least one small farm. The cleared land is largely confined to the bottom-lands along the creeks, where excellent corn and cotton can be grown. This can be described as permanent argicultural land.

Very little, however, of the longleaf pine land which has been cleared should be classed as agricultural land. Even the best of it, when newly broken, will not produce more than one-third of a bale of cotton or 15 bushels of corn per acre. Under the crude methods of local farming such fertility as it has becomes quickly exhausted and it soon begins to gully badly. It has often to be abandoned, even before the pine stumps upon it have rotted away.

These worn-out fields soon revert to forest. Usually within three or four years after cultivation has ceased the ground becomes completely covered with seedlings of loblolly, shortleaf, and longleaf pine, of which the first two greatly predominate over the last. These seedlings develop with great rapidity, within from ten to fifteen years forming dense thickets of saplings and small poles. Patches of this old field growth are found in all stages of development around every farm.

DAMAGE TO THE FOREST.

The two agencies which have in the past done most to alter the condition of the forest are fires and grazing. As compared with these, other causes of damage, such as insects and windfall, are unimportant.

FIRES.

Surface fires have been prevalent ever since anything was known about the country. It used to be the custom of the Indians to burn the woods to facilitate hunting, and the white settlers have kept up the practice to improve the grazing.

The constantly moist soils of the creek land have prevented fires from having any appreciable effect on this part of the forest; but on the longleaf pine land, where from late summer until early spring the ground cover, except during or immediately after rain, is in a constantly dry and inflammable condition, fires have occurred with increasing frequency, until now it is rare for any considerable area to

pass a year unburned. Some portions are burned twice within a year. Recurring as they do so often, the fires prevent the accumulation on the ground of a large amount of inflammable material, so that they are necessarily light and individually do only a small amount of harm. The aggregate damage, however, of a large number of fires, extending over many years, is enormous, and their effect upon the forest is far-reaching.

This damage shows itself in at least three important ways—

1. The impoverishment of the soil and the consequent loss in rate of growth of the timber.

2. The prevention of the reproduction of the longleaf pine.

3. The gradual destruction of the large trees.

Under present conditions, where the ground cover consists of a thin and straggling growth of grass and other herbaceous plants, as it does in many places, particularly on steep rocky slopes or on the tops of the high ridges, the soil is poorly protected from the weather. It washes and gullies readily under heavy rains, and during periods of drought it rapidly dries out and becomes hard and compact. It is steadily losing in fertility, and much plant food is being used up each year by the herbaceous growth which might be used by the pine, whose rate of growth is in consequence much retarded.

The effect of fires upon reproduction is easily seen. Any fire that is serious enough to destroy the dry grass is always hot enough to eat up all the small pine seedlings less than three or four years old which lie in its path. Only rare and isolated spots of small size are found which have escaped burning for three or four years, or until the seedlings which may have sprouted upon them have become so stout and tall that one ordinary grass fire does not kill them outright. Successful reproduction of the longleaf pine is found only on such small and isolated spots.

The effect of fires upon the standing timber is so gradual as to be scarcely noticeable. After the first few years of its life longleaf pine resists fire extremely well, better perhaps than any other species, and cases where a tree is killed or burned down by a single fire are rare. Nevertheless the timber succumbs to the repeated attacks of many fires. Any wound in the bark within 5 feet of the ground which allows the resin to run out is an opening of which the next fire will take advantage. With each succeeding fire the wound becomes larger, until the tree is burned completely through or is so weakened as to be broken off by a heavy wind. The effect of fire on the value of the lumber is also a factor to be reckoned with. Fire entering a tree reduces the grade of the lumber sawed from it, so that a fire-scarred tree is worth considerably less than a sound tree.

If fires were kept off the longleaf pine land entirely, the fertility of the soil would be improved, and the rate of growth of the timber

would be much more rapid, the reproduction of the pine would be more successful, the final stand of trees and yield in board feet per acre would be higher, and the lumber would grade better.

As regards the value of the land for ranging purposes, an occasional burning prevents the accumulating pine straw from crowding out the grass; but annual burning, while it keeps the pine straw from collecting, at the same time prevents the growth of grass from becoming strong and thick, and in some places kills it almost completely.

GRAZING.

About two years ago Coosa County passed a stock law abolishing the public range and obliging the farmers to keep their stock under fence. Since then no cattle or hogs, and but few sheep, have been allowed to run at large, so that no damage results from this source, but the effect of the grazing of past years is still apparent.

As the population and the amount of stock in the country increased the range was more heavily taxed with each succeeding year, until during the few years just previous to the passage of the stock law it was highly overstocked and very much run down. The canebrakes were almost entirely destroyed, and the grass on the uplands had greatly deteriorated, the more valuable forage plants being largely replaced by worthless wire grass and broom sedge.

It is doubtful if cattle or sheep have had any deteriorating effect on the timber-producing capacity of the forest, except as they have indirectly increased the frequency of fires. With the hogs, however, the case is different. They have done much to hinder the reproduction of the oaks on the creek land, and on the longleaf pine land are undoubtedly largely to blame for the lack of reproduction of chestnut and longleaf pine. They not only eat the seeds of the latter, but also, in times when other feed is scarce, uproot the large seedlings and small saplings to get the roots.

It is interesting to note that two years ago, about the time the stock law was passed and hogs were excluded from the forest, there was an abundant mast of longleaf pine, and that on those parts of the longleaf pine land which have not since been visited by fire the ground is thickly covered with 2-year-old seedlings. This reproduction was made possible by the removal of the hogs.

INSECT ENEMIES.

Insects have done but little harm. An occasional longleaf pine is found to be infested with a bark beetle, and on the shale and schist soils of the longleaf pine land or among the old field growth a small dense group of shortleaf and loblolly pine is sometimes found which has been heavily thinned by the same cause, but otherwise damage from insects is unimportant.

Division into Blocks.

In computing the stand and yield the forest was divided into blocks. Sections 6, 7, and 8 of T. 24 N., R. 18 E., comprising 1,748 acres of the area surveyed, were left out of consideration, because the forest upon them has been entirely destroyed. The other 34,236 acres were divided into six blocks.

Stand and Volume Tables of the Principal Trees.

THE LONGLEAF PINE.

Table I shows the height and clear length of longleaf pine according to diameter breasthigh. It is based upon measurements of trees felled by the lumber company in sections 12, 13, and 18 in Block I, and upon hypsometer measurements of standing trees on the high ridge in sections 21 and 22 in Block VI. Its purpose is to show the difference in height between the first-quality timber, which grows on the rolling land and has been produced under the most favorable conditions of soil and situation, and the poorer quality of timber found growing on the tops of the highest hills. (See Pl. II.)

Table I.—*Height and clear length of longleaf pine, Coosa County tract.*

Diameter, breast-high.	Quality I.		Quality II.		Diameter, breast-high.	Quality I.		Quality II.	
	Clear length.	Total height.	Clear length.	Total height.		Clear length.	Total height.	Clear length.	Total height.
Inches.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Inches.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
1	6	10	3	8	19	54	91	31	69
2	9	16	5	12	20	55	93	32	72
3	12	22	7	16	21	55	95	34	75
4	15	27	8	19	22	55	97	34	77
5	18	33	9	23	23	56	98	35	79
6	21	38	11	26	24	56	100	35	80
7	24	44	12	29	25	57	101	35	81
8	27	49	14	33	26	58	101	35	82
9	30	54	15	36	27	59	102	36	84
10	33	59	17	40	28	59	102	37	85
11	37	64	18	43	29	59	103	39	86
12	40	68	20	46	30	59	103	40	87
13	43	73	21	50	31	59	104	42	88
14	47	76	23	53	32	59	106	44	89
15	49	80	24	56	33	59	107	46	91
16	52	83	26	60	34	59	109	47	92
17	53	86	27	63	35	59	110	49	94
18	54	89	29	66	36	59	111	51	95

Table II gives the contents in board feet of longleaf pine for successive diameters from 10 to 36 inches. The figures were obtained by scaling with the Doyle rule the same trees that were measured for Table I. These figures were used to compute the yields of timber not only for the Coosa County tract, but also for the Bibb County tract. In addition, another volume determination was made for trees from 14 to 26 inches in diameter, on the basis of what they actually

sawed out in the mill. These results are printed side by side in Table II as an indication of how much the amount of lumber sawed from trees of different sizes exceeds the amount calculated by scaling the logs by the Doyle rule.

TABLE II.—*Volume of longleaf pine, Coosa County tract.*

Diameter, breast-high.	Volume, by Doyle rule in woods.	Volume, by board tally at mill.	Diameter, breast-high.	Volume, by Doyle rule in woods.	Volume, by board tally at mill.
Inches.	*Board feet.*	*Board feet.*	*Inches.*	*Board feet.*	*Board feet.*
10	17	.....	24	622	685
11	35	.....	25	694	753
12	57	.....	26	764	809
13	83	.....	27	834	.....
14	112	187	28	905	.....
15	142	208	29	980	.....
16	174	245	30	1,058	.....
17	207	298	31	1,136	.....
18	245	349	32	1,217	.....
19	293	379	33	1,300	.....
20	350	406	34	1,383	.....
21	413	485	35	1,467	.....
22	480	534	36	1,552	.....
23	550	627			

Table III was computed from measurements of trees cut by the lumber company in sections 12, 13, and 18, and by the sawmill in section 26, in Block I.

It gives the average age of longleaf pine on a basis of diameter breasthigh, and the average diameter breasthigh, on a basis of age. This table was used in computing the future yields both for the Coosa County and the Bibb County tracts.

TABLE III.—*Diameter growth of longleaf pine, Coosa County tract.*

Age on a basis of diameter breasthigh.		Diameter breasthigh, on a basis of age.		Age on a basis of diameter breasthigh.		Diameter breasthigh, on a basis of age.	
Diameter, breasthigh.	Age.	Age.	Diameter, breasthigh.	Diameter, breasthigh.	Age.	Age.	Diameter, breasthigh.
Inches.	*Years.*	*Years.*	*Inches.*	*Inches.*	*Years.*	*Years.*	*Inches.*
1	18	10	.....	16	117	160	20.6
2	25	20	1.4	17	126	170	21.5
3	31	30	2.8	18	135	180	22.4
4	37	40	4.5	19	145	190	23.2
5	43	50	6.2	20	155	200	24.0
6	49	60	7.9	21	165	210	24.7
7	54	70	9.6	22	175	220	25.4
8	60	80	11.2	23	187	230	26.0
9	66	90	12.6	24	200	240	26.7
10	72	100	14.0	25	215	250	27.3
11	79	110	15.2	26	230	260	27.9
12	86	120	16.3	27	245	270	28.5
13	93	130	17.4	28	261	280	29.1
14	100	140	18.5	29	278	290	29.7
15	108	150	19.6	30	295	300	30.3

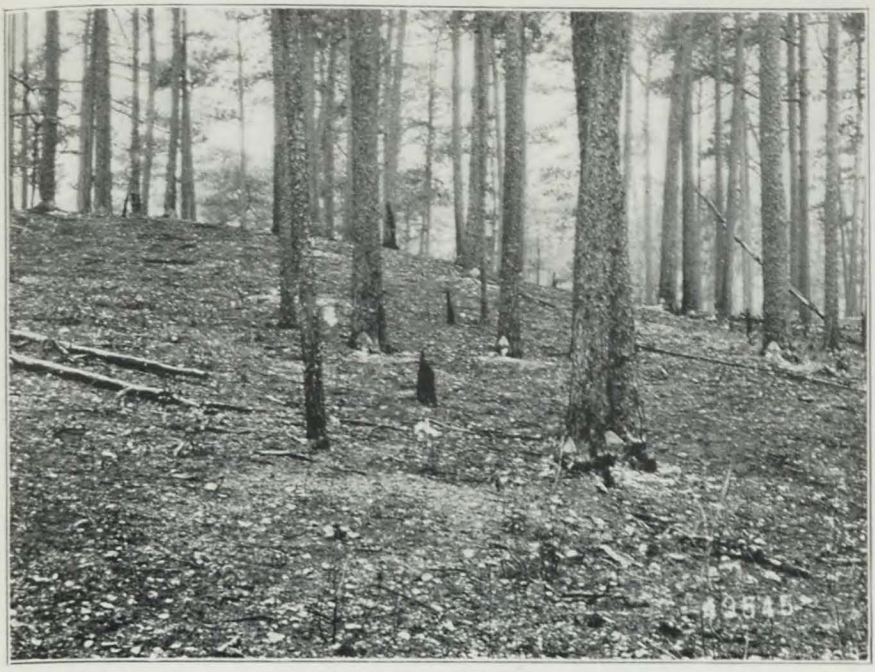

FIG. 1.—LONGLEAF PINE LAND RECENTLY BURNED OVER. TIMBER HAS JUST BEEN BOXED.

FIG. 2.—POOR GROWTH OF LONGLEAF PINE ON TOP OF HIGH HILL, WEOGUFKA MOUNTAINS.

From the foregoing tables it may be seen that on the better parts of the Coosa County tract, namely, on the rolling land, the rate of growth and general development of the longleaf pine is as good as the average in other parts of its range.

On the thin, dry, rocky soil of the steep slopes and on the summits of the high hills the development of the tree is naturally inferior.

THE LOBLOLLY PINE.

The loblolly pine, on account of its comparative scarcity and its inferior merchantable value, was not made the subject of detailed study. Enough measurements, however, were made on trees cut by the lumber company to compile the tables of height and volume. No measurements of shortleaf pine were made. Its yield from the stand tables was computed by means of the longleaf pine volume table.

Table IV gives the height of loblolly pine according to diameter breasthigh, and Table V gives its volume in board feet by Doyle rule on the same basis. The volume table was used in calculating the present merchantable yield of loblolly pine on both tracts.

TABLE IV.—*Height and clear length of loblolly pine, Coosa County tract.*

Diameter, breast-high.	Total height.	Clear length.	Diameter, breast-high.	Total height.	Clear length.
Inches.	*Feet.*	*Feet.*	*Inches.*	*Feet.*	*Feet.*
1	13	7	19	100	60
2	21	12	20	102	60
3	28	17	21	103	60
4	36	21	22	104	60
5	44	26	23	105	61
6	51	30	24	107	61
7	58	34	25	108	62
8	64	38	26	109	62
9	70	42	27	111	63
10	75	45	28	112	63
11	80	49	29	114	64
12	85	52	30	116	64
13	88	54	31	117	65
14	91	56	32	119	65
15	94	58	33	121	65
16	96	59	34	122	66
17	97	60	35	124	66
18	99	60	36	125	67

TABLE V.—*Volume of loblolly pine, Coosa County tract.*

Diameter breast-high.	Volume.	Diameter breast-high.	Volume.
Inches.	*Board feet.*	*Inches.*	*Board feet.*
10	17	24	577
11	34	25	652
12	54	26	735
13	75	27	819
14	98	28	907
15	126	29	1,001
16	158	30	1,104
17	198	31	1,210
18	240	32	1,331
19	285	33	1,475
20	336	34	1,643
21	388	35	1,840
22	444	36	2,050
23	506		

THE STAND BY BLOCKS.

Block I comprises section 18 of T. 24 N., R. 18 E., and sections 11, 12, 13, 14, 23, 24, 25, 26, and 27 of T. 24 N., R. 17 E. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	4,811	79.5
Creek land	811	13.4
Unwooded land	433	7.1
Total	6,055	100.0

The topography is rolling.

On the longleaf type the stand is pure longleaf, with little or no hardwood undergrowth. It is on this block that logging and turpentine operations are at present being carried on. In sections 11, 12, 13, 14, and 18 the company is cutting the pine to a diameter limit of 15 inches breasthigh. In sections 23, 24, 25, 26, and 27 the turpentine firm is boxing the trees to the same limit. In section 26 timber is being cut from the private holdings.

The stand and yield on this block was heavier than on any other part of the tract. Cutting to a diameter limit of 15 inches, the average yield of longleaf pine on the longleaf pine land would have been at least 9,000 board feet.

On the creek land the average yield of loblolly, combined with the small amount of longleaf and shortleaf which has crept in along the edges of the type, cutting to the same limit, would have amounted to a little over 1,100 feet.

Table VI shows the number of trees per acre that will be left on the longleaf pine land, as a basis for a second crop after lumbering, if the 15-inch limit is strictly adhered to and no trees under this size are cut, boxed, or otherwise injured. These will be distributed

over the area in even-aged groups and separated from one another by blank spaces of varying sizes.

On the creek land, as Table VI shows, the number of pines left after the logging will be insignificant. They will be scattered singly or in small groups among the slash and the hardwood trees.

TABLE VI.—*Stand on Block I, Coosa County tract, after cutting to 15 inches diameter breasthigh.*

Diameter breast-high.	Number of trees per acre.					
	Longleaf pine land (average of 232.4 acres).			Creek land (average of 57.7 acres).		
	Longleaf pine.	Shortleaf pine.	Loblolly pine.	Loblolly pine.	Longleaf pine.	Shortleaf pine.
Inches.						
1	4.39	0.01	0.02	1.23	0.64	.....
2	6.36	.03	.03	1.09	.69	0.19
3	7.04	.04	.06	.94	.78	.10
4	5.91	.03	.02	1.13	.94	.16
5	4.62	.08	.04	.94	.54	.09
6	3.85	.03	.04	.23	.49	.14
7	3.33	.05	.04	.33	.52	.16
8	3.09	.02	.03	.29	.26	.16
9	2.70	.03	.04	.43	.24	.09
10	2.71	.03	.03	.40	.24	.05
11	2.32	.03	.01	.33	.23	.09
12	2.38	.04	.01	.33	.24	.10
13	2.12	.04	.02	.28	.10	.09
14	2.31	.02	.02	.26	.16	.09
Total	53.13	.48	.41	8.21	6.07	1.51
Per cent	98.35	.89	.76	51.99	38.44	9.57

Block II comprises sections 8, 9, 10, 15, 16, 17, 21, 22, 28, 29, 31, 32, 33, and 34 of T. 24 N., R. 17 E. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	6,659	78.6
Creek land	831	9.8
Unwooded land	985	11.6
Total	8,475	100.0

Except for the small but steep hills in section 9, and for the York and Reedy mountains in sections 31 and 32, the topography is rolling. On the longleaf pine land the stand is pure longleaf, except on the steep northerly and westerly exposures in the northern part of the block, where it is mixed with some shortleaf and loblolly pine, mostly of sapling size, and hardwoods, and on the upper slopes of the York and Reedy mountains, where an occasional shortleaf of good merchantable size and quality is to be found.

Table VII shows the average stand per acre of the three pines on longleaf pine land and of the three pines and the more important hardwoods on creek land. The average yield in board feet per acre of each species of pine on each type is given in Tables XII and XIII.

TABLE VII.—*Present stand on Block II, Coosa County tract.*

Diameter breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 309.5 acres).			Creek land (average of 71.3 acres).							
	Long-leaf pine.	Short-leaf pine.	Lob-lolly pine.	Long-leaf pine.	Lob-lolly pine.	Short-leaf pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1	4.34	0.32	0.05	0.70	0.20	0.53	.....	.....	.....	.....	.....
2	7.65	.62	.16	1.14	.42	1.67	.....	.....	.....	.....	.....
3	8.71	.51	.17	1.63	.42	2.05	.....	.....	.....	.....	.....
4	7.68	.43	.18	1.40	.55	1.54	.....	.....	.....	.....	.....
5	5.39	.32	.15	1.12	.45	.91	.....	.....	.....	.....	.....
6	5.07	.22	.15	.80	.53	1.00	.....	.....	.....	.....	.....
7	4.64	.18	.05	.78	.32	.53	.....	.....	.....	.....	.....
8	3.71	.11	.07	.38	.22	.39	.....	.....	.....	.....	.....
9	2.82	.14	.06	.38	.24	.25	.....	.....	.....	.....	.....
10	3.06	.09	.05	.42	.20	.22	0.60	0.69	0.18	0.07	0.78
11	2.62	.07	.03	.27	.14	.13	.38	.41	.25	.18	.59
12	2.56	.08	.05	.29	.17	.10	.35	.43	.22	.15	.65
13	2.29	.05	.02	.27	.14	.03	.49	.28	.11	.25	.50
14	2.26	.03	.04	.17	.07	.11	.38	.22	.22	.13	.42
15	1.92	.04	.02	.17	.11	.03	.32	.19	.03	.13	.41
16	1.73	.03	.02	.18	.17	.01	.35	.15	.06	.20	.31
17	1.55	.02	.01	.14	.20	.04	.28	.21	.07	.11	.11
18	1.77	.01	.01	.06	.11	.....	.29	.21	.08	.04	.11
19	1.51	.01	.01	.10	.11	.....	.18	.11	.04	.06	.11
20	1.64	.01	.....	.04	.07	.....	.31	.11	.01	.04	.17
21	1.24	.02	.....	.08	.06	.....	.15	.07	.04	.10	.04
22	1.15	.01	.....	.11	.06	.03	.08	.01	.01	.11	.10
23	1.04	.....	.01	.07	.03	.03	.10	.....	.....	.07	.08
24	.89	.01	.....	.03	.06	.....	.08	.03	.03	.06	.01
25	.69	.01	.....	.04	.04	.01	.03	.03	.01	.11	.04
26	.52	.....	.....	.03	.01	.....	.08	.03	.01	.04	.04
27	.42	.....	.....	.06	.01	.....	.08	.....	.....	.03	.....
28	.26	.....	.....	.01	.....	.....	.03	.....	.....	.06	.04
29	.24	.....	.....	.03	.01	.....	.....	.....	.....	.01	.....
30	.17	.....	.....	.03	.....	.....	.....	.01	.....	.06	.....
31	.11	.....	.....	.01	.....	.....	.01	.....	.01	.06	.....
22	.06	.01	.....	.....	.....	.....	.....	.....	.....	.01	.....
33	.05	.....	.....	.....	.....	.....	.01	.....	.....	.03	.....
34	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
36	.04	.....	.....	.....	.....	.....	.....	.01	.01	.....	.....
37	.01	.....	.....	.01	.....	.....	.....	.....	.....	.....	.....
38	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
39	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.01	.....
43	.....	.....	.....	.....	.01	.....	.....	.....	.....	.....	.....
Total	79.90	3.35	1.31	10.95	5.13	9.61	.....	.....	.....	.....	.....
Per cent.	94.49	3.96	1.55	42.62	19.97	37.41	.....	.....	.....	.....	.....
TREES 10 INCHES AND OVER IN DIAMETER BREASTHIGH.											
Total	29.89	0.50	0.27	2.62	1.78	0.74	4.58	3.19	1.39	2.13	4.51
Per cent.	97.49	1.63	.88	12.51	8.50	3.53	21.87	15.24	6.64	10.17	21.54

The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches diameter breasthigh	50,828,000
Cutting to a limit of 14 inches diameter breasthigh	48,352,000
Cutting to a limit of 16 inches diameter breasthigh	44,683,000
Cutting to a limit of 18 inches diameter breasthigh	40,328,000

Block III comprises sections 7, 18, 19, 20, and 30 of T. 24 N., R. 17 E. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	1,912	63.1
Creek land	328	10.8
Unwooded land	791	26.1
Total	3,031	100.0

It includes the greater part of the schist and shale formation in the western part of the tract. The effect of the more fertile soil is shown in the composition of the forest on the longleaf pine land, where the proportion of hardwoods in the mixture is often large and the percentage of the shortleaf and loblolly pines is considerably higher than in Block II. A glance at the stand table, however, will show that the trees of these species are mostly small—of sapling and pole size—and consequently do not greatly affect the present yield in board feet. Of the longleaf pine, although the actual number of trees per acre is a trifle larger than in Block II, the size runs somewhat smaller, so that the yield in board feet per acre is a few hundred feet less.

Table VIII gives the average stand per acre of the three pines on the longleaf pine land, and of the three pines and some of the more important hardwoods on the creek land. The average yield per acre of each pine in each type is given in Tables XII and XIII.

TABLE VIII.—*Present stand on Block III, Coosa County tract.*

Diameter breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 863 acres).			Creek land (average of 32.2 acres).							
	Long-leaf pine.	Short-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Long-leaf pine.	Lob-lolly pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1	2.99	2.71	1.89	0.93	0.25	0.99	.....	.....	.....	.....	.....
2	6.95	3.56	2.38	1.93	.93	.62	.....	.....	.....	.....	.....
3	7.47	2.83	2.06	1.86	.75	1.15	.....	.....	.....	.....	.....
4	7.51	2.93	1.65	1.58	.62	.34	.....	.....	.....	.....	.....
5	6.11	1.88	1.00	1.37	.56	.59	.....	.....	.....	.....	.....
6	6.10	1.48	.60	1.24	.65	.68	.....	.....	.....	.....	.....
7	4.96	.89	.58	1.68	.62	.53	.....	.....	.....	.....	.....
8	5.35	.94	.59	.75	.47	.50	.....	.....	.....	.....	.....
9	3.96	.56	.37	.56	.40	.28	.....	.....	.....	.....	.....
10	3.93	.52	.34	.59	.40	.25	1.09	0.71	0.53	0.28	1.09
11	3.53	.42	.21	.25	.31	.25	.90	.56	.53	.16	.68
12	3.34	.37	.20	.16	.21	.12	.59	.47	.43	.09	.96
13	2.68	.17	.12	.16	.19	.19	.62	.47	.40	.09	.65
14	2.67	.25	.12	.09	.16	.31	.25	.50	.28	.12	.40
15	2.20	.19	.01	.09	.28	.12	.43	.34	.09	.12	.34
16	1.87	.06	.06	.....	.09	.19	.40	.19	.21	.03	.21
17	1.68	.07	.03	.03	.19	.....	.31	.09	.03	.09	.09
18	1.40	.08	.01	.....	.16	.03	.28	.16	.....	.09	.03
19	1.56	.05	.....	.03	.09	.12	.25	.03	.03	.12	.21
20	1.29	.03	.02	.03	.19	.12	.25	.16	.....	.06	.12
21	1.12	.03	.....	.....	.12	.06	.09	.....	.06	.19	.....
22	.92	.....	.01	.....	.19	.09	.12	.03	.....	.....	.03
23	.81	.....	.01	.03	.09	.09	.06	.....	.03	.03	.03
24	.65	.01	.....	.....	.06	.03	.03	.06	.06	.03	.....
25	.54	.01	.....	.....	.06	.03	.09	.03	.03	.06	.....
26	.44	.....	.....	.....	.03	.....	.....	.....	.....	.06	.....
27	.32	.....	.....	.....	.....	.03	.03	.06	.....	.....	.03
28	.29	.....	.....	.....	.....	.....	.....	.03	.....	.06	.....
29	.21	.....	.....	.....	.03	.06	.03	.....	.....	.06	.....
30	.15	.....	.01	.....	.03	.....	.03	.....	.....	.03	.....
31	.09	.....	.....	.....	.....	.....	.....	.....	.....	.03	.....
32	.05	.....	.....	.....	.....	.....	.....	.....	.....	.03	.....
33	.08	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
34	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
36	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
37	.....	.....	.....	.....	.....	.....	.....	.....	.....	.03	.....
38	.01	.....	.....	.....	.....	.....	.03	.....	.....	.....	.....
39	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
42	.01	.....	.....	.....	.....	.....	.....	.....	.....	.06	.....
52	.....	.....	.....	.....	.....	.....	.....	.....	.....	.03	.....
Total	83.31	20.04	12.27	13.36	8.13	7.77	.....	.....	.....	.....	.....
Per cent.	72.06	17.33	10.61	45.65	27.79	26.55	.....	.....	.....	.....	.....
TREES 10 INCHES AND OVER IN DIAMETER BREASTHIGH.											
Total	31.91	2.26	1.15	1.46	2.88	2.09	5.88	3.89	2.71	1.95	4.87
Per cent.	90.35	6.40	3.35	5.68	11.19	8.12	22.85	15.12	10.53	7.58	19.93

The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches diameter breasthigh	13,722,000
Cutting to a limit of 14 inches diameter breasthigh	12,771,000
Cutting to a limit of 16 inches diameter breasthigh	11,428,000
Cutting to a limit of 18 inches diameter breasthigh	10,033,000

Block IV comprises sections 35 and 36 of T. 24 N., R. 17 E., and sections 1, 2, 3, and 10 of T. 23 N., R. 17 E. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	2,482	64.8
Creek land	552	14.4
Unwooded land	798	20.8
Total	3,832	100.0

With the exception of one low ridge, which begins in the center of section 1 and extends in a northeast direction across the southeast corner of section 36, the land is only moderately rolling, in places almost level. The soil everywhere is deep, and there is no outcrop of rock except in the beds of the creeks. This and the exceptionally broad bottomlands along the Finnegotchkee accounts for the large proportion of cleared land.

Although in the eastern part of the block, especially in section 36, considerable cutting has been done, the stand on the longleaf pine land is still fairly good. The proportion of loblolly pine in the mixture, especially of trees under 10 inches diameter breasthigh, is noticeably large. On the creek land the stand of loblolly pine of all diameter classes, and the yield in board feet is much greater than on any of the preceding blocks.

Table IX gives the average stand per acre of the three pines on longleaf pine land, and of the three pines and the more important hardwoods on the creek land. The average yield per acre of each pine on each type is given in Tables XII and XIII.

TABLE IX.—*Present stand on Block IV, Coosa County tract.*

Diameter breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 87.9 acres).			Creek land (average of 30.9 acres).							
	Long-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Lob-lolly pine.	Long-leaf pine.	Short-leaf pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1.....	1.84	1.76	0.41	2.14	0.16	0.06	.....	.....	.....	.....	.....
2.....	3.90	4.17	1.00	1.39	.26	.03	.....	.....	.....	.....	.....
3.....	5.49	4.46	.95	2.10	.19	.39	.....	.....	.....	.....	.....
4.....	4.71	4.11	.85	2.46	.29	.10	.....	.....	.....	.....	.....
5.....	4.81	3.74	.93	2.94	.16	.19	.....	.....	.....	.....	.....
6.....	4.37	3.34	.64	2.49	.19	.36	.....	.....	.....	.....	.....
7.....	3.52	2.67	.65	2.07	.16	.13	.....	.....	.....	.....	.....
8.....	3.47	1.42	.42	1.39	.26	.26	.....	.....	.....	.....	.....
9.....	2.95	1.52	.25	1.55	.06	.16	.....	.....	.....	.....	.....
10.....	3.14	1.25	.28	1.59	.13	.10	0.32	0.68	0.71	0.39	0.84
11.....	2.64	.92	.23	1.55	.06	.06	.36	.65	.74	.26	.87
12.....	2.09	.55	.32	.78	.03	.13	.36	.65	.32	.26	.78
13.....	2.21	.61	.24	.81	.13	.....	.23	.55	.32	.26	.61
14.....	1.85	.41	.18	.61	.....	.06	.45	.49	.29	.23	.84
15.....	1.83	.35	.13	.52	.....	.03	.39	.29	.36	.26	.68
16.....	1.59	.30	.10	.65	.06	.....	.13	.32	.26	.19	.36
17.....	1.32	.14	.08	.55	.06	.13	.32	.39	.19	.13	.32
18.....	1.34	.16	.06	.29	.13	.06	.13	.26	.03	.10	.45
19.....	1.02	.16	.05	.42	.03	.06	.13	.06	.16	.06	.23
20.....	1.15	.10	.02	.23	.06	.06	.13	.16	.16	.03	.16
21.....	1.10	.06	.01	.29	.06	.....	.23	.06	.06	.....	.10
22.....	1.16	.08	.01	.06	.16	.06	.13	.06	.06	.03	.19
23.....	.91	.06	.....	.13	.....	.03	.13	.19	.10	.06	.16
24.....	.69	.03	.01	.13	.03	.....	.03	.03	.....	.....	.13
25.....	.56	.05	.....	.16	.06	.....	.03	.03	.10	.06	.10
26.....	.38	.05	.01	.13	.03	.03	.03	.06	.....	.....	.....
27.....	.31	.03	.....	.13	.....	.03	.06	.03	.03	.....	.....
28.....	.25	.01	.....	.13	.....	.03	.06	.....	.....	.....	.....
29.....	.15	.....	.....	.03	.....	.....	.06	.....	.....	.03	.03
30.....	.19	.....	.01	.10	.03	.....	.03	.....	.03	.....	.....
31.....	.07	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....
32.....	.05	.....	.....	.10	.....	.....	.03	.03	.06	.....	.....
33.....	.06	.01	.....	.....	.....	.....	.03	.....	.....	.....	.....
34.....	.05	.....	.....	.03	.....	.....	.03	.....	.....	.....	.....
35.....	.03	.....	.....	.03	.....	.....	.....	.....	.....	.....	.....
36.....	.01	.....	.....	.03	.03	.....	.....	.....	.....	.03	.....
37.....	.03	.....	.....	.....	.....	.....	.....	.03	.....	.....	.....
38.....	.....	.....	.....	.03	.....	.....	.....	.....	.....	.....	.....
39.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40.....	.....	.....	.....	.06	.....	.....	.....	.....	.....	.....	.....
Total	61.24	32.53	7.84	28.10	2.82	2.55	.....	.....	.....	.....	.....
Per cent.	60.27	32.01	7.72	83.95	8.43	7.62	.....	.....	.....	.....	.....
TREES 10 INCHES AND OVER IN DIAMETER BREASTHIGH.											
Total	26.18	5.34	1.74	9.57	1.09	0.87	3.83	5.02	3.98	2.38	6.85
Per cent.	78.71	16.06	5.23	28.49	3.25	2.59	11.40	14.94	11.85	7.09	20.39

The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches diameter breasthigh	18,071,000
Cutting to a limit of 14 inches diameter breasthigh	16,970,000
Cutting to a limit of 16 inches diameter breasthigh	15,410,000
Cutting to a limit of 18 inches diameter breasthigh	13,959,000

Block V comprises sections 4, 5, 6, 7, 8, 9, 16, 17, and 18 of T. 23 N., R. 17 E. Its area is made up of:

	Acres.	Per cent.
Longleaf pine land	4,261	73.5
Creek land	672	11.6
Unwooded land	861	14.9
Total	5,794	100.0

The land is rolling, except in the northwestern part in section 6, where, as the Reedy Mountains are approached, it becomes quite rough and hilly. Except for the small amount of cutting around the old mill in section 17 the forest remains untouched by the ax.

On the longleaf land the stand and yield of longleaf pines is very nearly the same as that on Block II, but the percentage of loblolly and shortleaf in the mixture makes the total yield per acre of all three pines a trifle higher. Although the longleaf pine will not cut so much to the acre here as on Block I, still in the eastern part of the block on the deep soil of the rolling land in sections 4 and 9 the trees individually reach a better development, both in diameter and height, than on any other part of the tract. On the creek type of this block the loblolly pine in both quantity and quality is much better even than that in Block IV. In section 9, along Gold Branch, there are several small groups of unusually fine and large trees of this species. On the longleaf land in the eastern half of section 9 and extending into section 10 there is a large area of old field which was "turned out" over thirty years ago and has since come up to a pure stand of shortleaf pine—an interesting fact, since second growth on abandoned farm land usually consists for the most part of loblolly pine. Although this stand of shortleaf is as yet too small to have any merchantable value it promises to play a part in the second crop.

Table X gives the average stand per acre of the three pines on longleaf pine land, and of the three pines and the more important hardwoods on creek land. The average yield per acre of each pine on each type can be found in Tables XII and XIII.

TABLE X.—*Present stand on Block V, Coosa County tract.*

Diameter breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 197.7 acres).			Creek land (average of 49.9 acres).							
	Long-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Long-leaf pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1	2.39	0.59	0.48	1.20	0.94	0.30	.....	.....	.....	.....	.....
2	3.80	1.21	.64	2.50	1.84	.66	.....	.....	.....	.....	.....
3	4.60	1.35	.48	2.04	1.82	.54	.....	.....	.....	.....	.....
4	4.66	1.20	.49	2.36	1.38	.36	.....	.....	.....	.....	.....
5	3.76	1.04	.48	2.16	1.54	.46	.....	.....	.....	.....	.....
6	3.33	1.07	.30	2.08	.92	.22	.....	.....	.....	.....	.....
7	2.65	.86	.30	1.80	.94	.40	.....	.....	.....	.....	.....
8	2.56	.63	.30	1.36	.34	.10	.....	.....	.....	.....	.....
9	2.20	.42	.20	1.24	.32	.22	.....	.....	.....	.....	.....
10	1.86	.33	.19	1.34	.14	.12	0.44	0.78	0.20	0.28	0.44
11	1.86	.31	.13	.90	.16	.14	.52	.58	.26	.14	.34
12	1.83	.21	.09	1.04	.04	.20	.34	.48	.12	.30	.52
13	1.86	.16	.03	.68	.04	.24	.42	.70	.14	.12	.34
14	1.62	.18	.05	.58	.06	.04	.44	.30	.10	.32	.52
15	1.67	.13	.03	.52	.04	.16	.42	.38	.18	.08	.26
16	1.52	.10	.05	.68	.06	.20	.30	.24	.18	.34	.36
17	1.50	.07	.03	.62	.06	.20	.30	.18	.18	.12	.28
18	1.55	.03	.02	.30	.04	.12	.24	.18	.08	.20	.18
19	1.32	.03	.04	.48	.....	.12	.18	.14	.04	.08	.26
20	1.25	.02	.03	.24	.06	.10	.20	.06	.04	.14	.30
21	1.25	.01	.01	.24	.02	.10	.22	.10	.02	.12	.10
22	1.11	.03	.....	.20	.04	.18	.22	.06	.06	.....	.06
23	.91	.01	.....	.10	.....	.16	.08	.06	.06	.08	.04
24	.76	.02	.01	.10	.06	.08	.14	.06	.04	.06	.02
25	.69	.01	.02	.08	.....	.14	.10	.02	.02	.02	.....
26	.62	.01	.01	.10	.02	.14	.16	.....	.02	.02	.02
27	.43	.01	.....	.14	.02	.02	.08	.....	.....	.08	.....
28	.35	.....	.....	.06	.....	.04	.06	.....	.....	.04	.....
29	.26	.01	.....	.....	.....	.....	.04	.02	.04	.04	.04
30	.19	.01	.....	.10	.....	.06	.06	.....	.....	.....	.02
31	.14	.....	.....	.12	.....	.....	.02	.....	.....	.04	.....
32	.08	.....	.....	.06	.....	.04	.04	.....	.02	.02	.....
33	.04	.01	.....	.04	.....	.....	.....	.....	.....	.02	.....
34	.06	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
35	.01	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
36	.03	.....	.01	.06	.....	.....	.....	.02	.....	.....	.....
37	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
38	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
39	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
43	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
48	.....	.....	.....	.....	.....	.....	.....	.....	.....	.02	.....
65	.....	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	54.74	10.08	4.42	25.60	10.90	5.86	.....	.....	.....	.....	.....
Per cent.	79.06	14.56	6.38	60.44	25.73	13.83	.....	.....	.....	.....	.....
TREES 10 INCHES AND OVER IN DIAMETER BREASTHIGH.											
Total	24.79	1.71	0.75	8.86	0.86	2.60	5.02	4.36	1.80	2.68	4.10
Per cent.	90.97	6.28	2.75	29.26	2.84	8.59	16.58	14.40	5.94	8.85	13.54

The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches diameter breasthigh	35,388,000
Cutting to a limit of 14 inches diameter breasthigh	34,045,000
Cutting to a limit of 16 inches diameter breasthigh	31,962,000
Cutting to a limit of 18 inches diameter breasthigh	29,104,000

Block VI occupies the remainder of the tract, sections 11, 12, 13, 14, 15, 19, 20, 21, 22, 23, and 24 of T. 23 N., R. 17 E. Its area is made up of:

	Acres.	Per cent.
Longleaf pine land	6,122	86.8
Creek land	583	8.3
Unwooded land	344	4.9
Total	7,049	100.0

From a botanical point of view, this is the most interesting part of the tract, but to the forester it is the least valuable. Almost the whole area is taken up with steep, rocky hills and ridges of the Weogufka Range.

On the shallow, dry, sandy soils of the upper slopes and tops of the ridges the longleaf pine is stunted, slow-growing, and rarely reaches a large diameter. The stand is generally open. On the northern and western exposures the hardwoods and sometimes the loblolly pine mix with the longleaf. The best developed stands on the block are in the northern halves of sections 11, 15, 19, 20, and 21, on the moderate northerly slopes, where the land rises gradually from the rolling country of Blocks IV and V, and in sections 22 and 23, south of Weogufka Mountain, where the hills give way to the rolling country lying beyond the southern boundary of the tract.

As compared with the rest of the tract, logging on Block VI would be very expensive. In the roughest parts, where the building of railroads and handling of timber would be most difficult, the stand is often so light that logging under present market conditions would not pay.

The average stand and yield on the longleaf pine land, as shown in the tables below, is poorer than on any other part of the tract. On the creek type the stand of loblolly pine is a trifle above the average, but is far from being heavy enough to be of any great importance.

Table XI gives the average stand per acre of the three pines on longleaf pine land, and of the three pines and the more important hardwoods on creek land. The average yield per acre of each pine on each type can be found in Tables XII and XIII.

TABLE XI.—*Present stand on Block VI, Coosa County tract.*

Diameter breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 294.1 acres).			Creek land (average of 41.6 acres).							
	Long-leaf pine.	Short-leaf pine.	Lob-lolly pine.	Lob-lolly pine.	Short-leaf pine.	Long-leaf pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1	2.36	0.44	0.06	0.46	0.43	0.22	.....	.....	.....	.....	.....
2	4.22	.85	.25	.22	1.25	.24	.....	.....	.....	.....	.....
3	4.55	1.12	.24	.34	1.20	.34	.....	.....	.....	.....	.....
4	4.37	1.05	.21	.26	1.13	.19	.....	.....	.....	.....	.....
5	3.61	.65	.19	.41	.67	.12	.....	.....	.....	.....	.....
6	2.84	.54	.13	.55	.38	.22	.....	.....	.....	.....	.....
7	2.74	.39	.15	.38	.50	.12	.....	.....	.....	.....	.....
8	2.39	.27	.13	.43	.36	.17	.....	.....	.....	.....	.....
9	2.54	.19	.13	.50	.14	.14	.....	.....	.....	.....	.....
10	2.43	.21	.12	.38	.12	.14	0.50	0.55	0.12	0.19	1.13
11	2.05	.16	.10	.48	.19	.19	.46	.87	.31	.12	1.13
12	2.04	.11	.13	.26	.10	.05	.36	.65	.31	.22	1.13
13	1.84	.15	.09	.48	.05	.12	.43	.55	.31	.10	.67
14	1.77	.09	.06	.50	.12	.17	.43	.55	.36	.07	.65
15	1.58	.09	.04	.22	.....	.10	.43	.50	.17	.14	.48
16	1.49	.07	.05	.36	.07	.07	.31	.41	.17	.19	.60
17	1.52	.04	.03	.12	.....	.10	.22	.36	.07	.05	.29
18	1.44	.04	.04	.19	.....	.10	.34	.34	.10	.17	.43
19	1.32	.01	.04	.17	.....	.05	.19	.22	.07	.10	.29
20	1.15	.01	.02	.17	.02	.05	.14	.05	.05	.17	.14
21	1.05	.02	.01	.24	.02	.05	.17	.14	.12	.19	.05
22	.98	.....	.02	.12	.07	.17	.07	.10	.05	.19	.07
23	.73	.01	.....	.07	.....	.14	.14	.10	.10	.05	.10
24	.57	.02	.....	.05	.....	.07	.07	.05	.05	.....	.....
25	.43	.....	.01	.07	.02	.02	.12	.02	.....	.02	.02
26	.34	.....	.....	.07	.....	.02	.12	.07	.05	.05	.....
27	.27	.....	.....	.07	.....	.02	.....	.05	.....	.07	.05
28	.15	.....	.....	.07	.....	.02	.....	.02	.....	.05	.02
29	.17	.....	.....	.05	.....	.02	.....	.....	.....	.10	.05
30	.09	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
31	.07	.....	.....	.....	.....	.02	.....	.....	.....	.02	.....
32	.03	.....	.....	.....	.....	.02	.....	.....	.....	.02	.....
33	.02	.....	.....	.05	.....	.....	.02	.....	.....	.....	.....
34	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
37	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
38	.....	.....	.....	.....	.....	.....	.....	.....	.....	.02	.....
40	.....	.....	.....	.02	.....	.....	.....	.....	.....	.02	.....
48	.....	.....	.....	.....	.....	.....	.....	.....	.....	.02	.....
51	.....	.....	.....	.....	.....	.....	.....	.....	.....	.02	.....
Total.	53.18	6.63	2.25	7.78	6.84	3.47	.....	.....	.....	.....	.....
Per cent.	85.69	10.68	3.63	43.01	37.81	19.18	.....	.....	.....	.....	.....
TREES 10 INCHES AND OVER IN DIAMETER BREASTHIGH.											
Total.	23.56	1.03	0.76	4.23	0.78	1.71	4.52	5.60	2.41	2.36	7.30
Per cent.	92.94	4.06	3.00	14.63	2.70	5.92	15.63	19.37	8.34	8.16	25.25

The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches diameter breasthigh	35,332,000
Cutting to a limit of 14 inches diameter breasthigh	33,446,000
Cutting to a limit of 16 inches diameter breasthigh	30,577,000
Cutting to a limit of 18 inches diameter breasthigh	26,775,000

TABLE XII.—*Present yield on longleaf pine land, Coosa County tract.*

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 12 INCHES.

Number of block.	Area.	Longleaf pine.		Shortleaf pine.		Loblolly pine.	
		Average yield per acre.	Total yield.	Average yield per acre.	Total yield.	Average yield per acre.	Total yield.
	Acres.	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*
I[a]							
II	6,659	7,399	49,269,941	89	592,651	26	173,134
III	1,912	6,718	12,844,816	185	353,720	80	152,960
IV	2,482	5,948	14,762,936	181	449,242	602	1,494,164
V	4,261	7,349	31,314,089	104	443,144	222	945,942
VI	6,122	5,433	33,260,826	104	636,688	86	526,492
Total.	21,436	6,599	141,452,608	115	2,475,445	154	3,292,692

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 14 INCHES.

I[a]							
II	6,659	7,063	47,032,517	78	519,402	22	146,498
III	1,912	6,305	12,055,160	150	286,800	60	114,720
IV	2,482	5,645	14,010,890	142	352,444	527	1,308,014
V	4,261	7,088	30,201,968	96	409,056	198	843,678
VI	6,122	5,164	31,614,008	86	526,492	72	440,784
Total.	21,436	6,294	134,914,543	98	2,094,194	133	2,853,694

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 16 INCHES.

I[a]							
II	6,659	6,538	43,536,542	69	459,471	15	99,885
III	1,912	5,693	10,885,016	95	181,640	46	87,952
IV	2,482	5,178	12,851,796	103	255,646	443	1,099,526
V	4,261	6,669	28,416,609	86	366,446	164	698,804
VI	6,122	4,741	29,024,402	63	385,686	61	373,442
Total.	21,436	5,818	124,714,365	77	1,648,880	110	2,359,609

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 18 INCHES.

I[a]							
II	6,659	5,916	39,394,644	59	392,881	10	66,590
III	1,912	5,020	9,598,240	70	133,840	30	57,360
IV	2,482	4,760	11,814,320	69	171,258	368	913,376
V	4,261	6,094	25,966,534	71	302,531	135	575,235
VI	6,122	4,167	25,510,374	42	257,124	47	287,734
Total.	21,436	5,238	112,284,112	59	1,257,634	89	1,900,295

[a] Now being cut to a breasthigh diameter limit of 15 inches.

TABLE XIII.—*Present yield on creek land, Coosa County tract.*

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 12 INCHES.

Number of block.	Area.	Longleaf pine.		Shortleaf pine.		Loblolly pine.	
		Average yield per acre.	Total yield.	Average yield per acre.	Total yield.	Average yield per acre.	Total yield.
	Acres.	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*
I[a]							
II	831	541	449,571	73	60,663	339	281,709
III	328	647	212,216	87	28,536	396	129,888
IV	552	368	203,136	219	120,888	1,886	1,041,072
V	672	850	571,200	168	112,896	2,978	2,001,216
VI	583	489	285,087	98	57,134	970	565,510
Total.	2,966	580	1,721,210	128	380,117	1,355	4,019,395

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 14 INCHES.

I[a]							
II	831	402	334,062	64	53,184	320	265,920
III	328	519	170,232	65	21,320	375	123,000
IV	552	356	196,512	212	117,024	1,784	984,768
V	672	820	551,040	163	109,536	2,871	1,929,312
VI	583	476	277,508	88	51,304	920	536,360
Total.	2,966	516	1,529,354	119	352,368	1,294	3,839,360

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 16 INCHES.

I[a]							
II	831	359	298,329	48	39,888	299	248,469
III	328	462	151,536	42	13,776	329	107,912
IV	552	356	196,512	201	110,952	1,623	895,896
V	672	792	532,224	150	100,800	2,748	1,846,656
VI	583	443	258,269	75	43,725	843	491,469
Total.	2,966	484	1,436,870	104	309,141	1,211	3,590,402

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 18 INCHES.

I[a]							
II	831	299	248,469	38	31,578	233	193,623
III	328	408	133,824	36	11,808	299	98,072
IV	552	333	183,816	175	96,600	1,412	779,424
V	672	716	481,152	128	86,016	2,518	1,692,096
VI	583	410	239,030	63	36,729	762	444,246
Total.	2,966	434	1,286,291	89	262,731	1,081	3,207,461

[a] Now being cut to a breasthigh diameter limit of 15 inches.

LUMBERING THE PRESENT CROP.

CUTTING.

On the advice of the Forest Service, the company in October, 1903, began cutting to a diameter limit and marking the trees which were to be removed. The diameter limit recommended temporarily by the

Forest Service was 16 inches, to be raised or lowered slightly as the stand of trees was found open or dense, the object being to distribute as evenly as possible the trees left standing as a basis for a second crop. After the first few weeks of marking, this practice was given up, and the diameter limit was lowered to 15 inches. All trees 15 inches and over in diameter are now being cut regardless of whether the stand is open or dense or whether the average diameter of the trees is large or small. Care, however, is exercised in the felling, so that except in dense clumps, where a certain amount of injury is unavoidable, but few of the trees under 15 inches left standing as a basis for a second crop are broken down or otherwise damaged.

Except where extra length is required to fill special bills, it is the rule to cut short logs of the regulation 16, 14, and 12 foot lengths. This makes it possible to work up the timber much more closely than is commonly done in longleaf-pine logging, where log lengths of from 24 to 36 feet are cut. The bole of the tree is used well up into the top, and very little material is left in the woods that can be put through the mill at a profit. Together with the longleaf, loblolly, and shortleaf pine, white and cow oak and yellow poplar logs are taken wherever merchantable trees of these species are found.

TRANSPORTATION.

The company removes its timber by a private railroad which connects with the Central Railroad of Georgia at Overbrook, about 4 miles west of Hollins. This road enters the surveyed area in the northwest corner of section 8, township 24 north, range 18 east, and extends in a generally southwestern direction into the center of section 12, where the company's logging camp is now located. From this point, if the original plans are carried out, it will be extended across the northwest quarter of section 13 into the eastern edge of section 14, and then turn south, leaving the divide and following the valley of Finnegotchkee Creek through sections 24, 25, 26, and 35 of township 24 north, range 17 east, and sections 2, 10, 15, and 22 of township 23 north, range 17 east.

This main line, which will be in use for several years and may finally become a permanent railroad, is being built to last. The route has been carefully surveyed and grading is being thoroughly done. The only place, however, where construction will be at all expensive is in sections 15 and 22 of township 23 north, range 17 east, in the Finnegotchkee Narrows, where the creek cuts through the Weogufka Mountains and where the slopes are very steep and rocky. A good deal of heavy grading and bridge building will be necessary. The temporary spurs which run out from the main line at quarter-mile to half-mile intervals, following, as a rule, the water courses, where

grading is cheapest, are much less carefully constructed. They are built to last only long enough for the removal of the timber tributary to them. Heavy grading is avoided as much as possible. In the place of earth fills, corduroy and timber trestle work are used.

Since the company became interested in the production of a second crop it has avoided as much as possible the use of merchantable longleaf pine in its railroad construction and also the use of trees which will be of merchantable size within 25 or 30 years. Longleaf pine ties are still used on the main line, but they are either sawed at the mill from rough and knotty top logs or are hewed from dead and down timber along the right of way. For the temporary spurs, which, it is expected, will be in use only a few months, ties are hewed from any kind of hardwood of the proper size which is available. Yellow poplar, in the creek type, of which there is a number of trees from 10 to 15 inches in diameter—just the proper tie size—is preferred because it is so easy to work and to handle. For corduroy and trestle-work the poorest pine is used, and then only when hardwoods of the proper dimensions are out of reach. As the places where timber is required for this purpose are almost always located on the creek land where hardwoods are abundant, very little pine is sacrificed.

Loading is done by steam in the usual way. Skidding is done entirely with horses. Instead of the heavy, high-wheeled logging cart, which requires two teams to pull it, so common in the level pine forests farther south, the small, low-wheeled, self-loading go-devil drawn by one team is used. Although it does not take so great a load at one time, it is preferred because it is lighter and less clumsy to handle, particularly on the steep slopes.

The maximum skidding distance is about a quarter of a mile. The swamping out or preparation of the skidding roads is simple, nothing being done beyond the removal of a fallen tree or the laying of a little corduroy over an occasional soft place.

MANUFACTURING.

The company saws regular stock sizes of boards, dimension stuff, flooring, ceiling, laths, etc., and makes a specialty of finishing and edge grain (rift) flooring and bill timbers. The products of the mill find their market throughout the States east of the Mississippi River. Special timbers, such as bridge stringers, etc., are sold largely to the railroads for local consumption.

Other mills, which are run under contract and whose daily capacity is small—from 15,000 to 20,000 feet, board measure—are being used to work up the timber on outlying portions of the tract, and saw principally common lumber and squared timbers.

TURPENTINING.

The timber to be boxed is marked beforehand in the same way as that which is to be cut. Only those trees which are 15 inches and over in diameter and are to be cut later for saw logs are allowed to be boxed.

GENERAL RECOMMENDATIONS.

In railroad building, in skidding, and in felling the destruction and waste of young longleaf pine, which at present is too small to be merchantable, but which can be counted on to form a part of the next crop, is in nearly every case avoided as far as circumstances will permit. In a few instances, however, where timber is being cut in or near groups of second growth, extra care should be taken by the sawyers to avoid felling trees into these groups. In this way the thrifty young poles and saplings of which these groups are composed, instead of being broken down and ruined, might be saved to grow up to merchantable size. With very little care and no additional expense trees could be felled away from young growth, leaving the slash where fire would do least damage.

CUTTING TO A DIAMETER LIMIT.

Owing to the marked tendency of the longleaf pine to reproduce by groups and to the consequent fact that the forest is composed of even-aged groups, in each of which the trees are nearly of even age, the practice of adhering strictly to one diameter limit in cutting, of taking out absolutely all trees 15 inches and over in diameter, and of leaving absolutely all trees under that size, does not leave the forest in the best possible condition for producing a second crop.

In the older groups, which cover areas varying in size from a fraction of an acre up to several acres and in which practically all the trees are over 15 inches in diameter, the cutting is virtually clean, and there is nothing left as a basis for a second crop except a few scattered, much suppressed, and stunted trees.

On the other hand, no trees are felled in the younger groups, where nearly all the timber is under 15 inches in diameter, and where the judicious selection and removal of some of the trees which are being suppressed by or are crowding their neighbors would result in a more rapid and healthy development of the stand. The proportion of the forest where the distribution of the diameter classes is such that cutting to a fixed diameter limit of 15 inches results simply in the removal of the dominant trees and the leaving of a stand of smaller trees evenly distributed over the ground and in the best condition to develop into a second crop, is extremely small. The intelligent use of a diameter limit in this forest requires that the limit be raised or lowered

to suit the needs of each particular part of the forest, a practice which would result in leaving the stand in a considerably better silvical condition. It would, of course, be impossible to cut in such a way as to leave a basis for a second crop evenly distributed over the whole area, because in many of the older groups the trees are all obviously overmature and are increasing in value so slowly that to leave any of them standing would be a decided financial loss; and it would, on the other hand, be impossible to extend the cutting absolutely over all the forest, because in many of the younger groups the trees are all far too small to be merchantable and could be cut only at a loss.

Among the older groups there are trees from 15 to 18 inches in diameter which are sound, healthy, and still increasing in volume at a satisfactory rate and which it would pay to leave standing until the second crop is harvested. On the other hand, among the younger groups, trees from 12 to 15 inches in diameter are to be found which can be handled at a slight profit, and whose removal would increase the rate of growth of the trees remaining.

TURPENTINING.

As long as the boxing for turpentine is confined to those trees which are already mature and which will within the next two years be cut for sawlogs, injury to the other trees is prevented and, beyond the fact that while it is carried on it will encourage the frequency of surface fires, the turpentining will in itself have no effect, either good or bad, on the future productive capacity of the forest.

The question of the advisability of boxing for turpentine is merely one of present profits, whether or not the revenue per acre or per tree derived from the lease of the boxing rights exceeds the loss in value per acre or per tree of the saw timber. This question was not made a matter for careful measurement and comparison. The lumber company will decide whether its turpentining lease is profitable by actual trial over a small portion of the tract, which will be lumbered within the next two years.

The Second Crop.

ESTIMATE OF FUTURE YIELD AND INTEREST RETURNS.

The company looks forward to a second crop of timber from its lands in 25 years. The merchantable yield per acre after this period must average about 3,000 feet board measure, since a smaller amount could not be lumbered at so high a profit. In determining, therefore, the diameter to which the trees should now be cut, it has been assumed that no limit which will produce less than 2,500 feet board measure per acre after 30 years will be considered by the company.

The estimate of future yields has been confined to the longleaf pine on the longleaf pine land.

Block I, on which the area of longleaf-pine land is 4,811 acres, and on which all of the pine down to and including 15 inches in diameter breasthigh, has been, or soon will have been, cut or boxed, has been considered separately.

Table XIV gives an estimate of the present yield per acre in board feet of all the merchantable trees, namely, 12 to 14 inches in diameter breasthigh, which will be left standing after the present boxing and lumbering. It estimates the future yield, cutting to a limit of 12 inches in diameter breasthigh after 20, 30, and 40 years, provided all trees 14 inches and under in diameter breasthigh are left standing and continue to grow at the same rate as given in Table III in the first part of this report.

TABLE XIV.—*Future yields of longleaf pine on longleaf pine land.*

Block I: Average present yield per acre, cutting to 15 inches in diameter breasthigh.	Coosa County tract: Average yield per acre, cutting to 12 inches in diameter breasthigh, obtainable at the end of—		
	20 years.	30 years.	40 years.
Board feet.	*Board feet.*	*Board feet.*	*Board feet.*
570	1,747	2,634	4,066

Blocks II, III, IV, V, and VI, containing a total of 22,994 acres of longleaf pine land, have been combined, and an average acre has been computed for the whole area. The results are shown in Table XV, which gives the present yield per acre in board feet, cutting to a diameter limit of 12, 14, 16, and 18 inches, and also the future yields to be expected 20, 30, and 40 years hence, cutting to a diameter limit of 12 inches, if the present cutting diameter limit is 12, 14, 16, and 18 inches, respectively.

These estimates are based on the assumption that all trees under the diameter limit given for the first cutting are left standing and continue to grow at the same rate as that given in Table III.

TABLE XV.—*Future yields of longleaf pine on longleaf pine land.*

Blocks II, III, IV, V, and VI.		Coosa County tract: Average yield per acre, cutting to 12 inches in diameter breasthigh, obtainable at the end of—		
Cutting limit, diameter breasthigh.	Average present yield per acre.	20 years.	30 years.	40 years.
Inches.	*Board feet.*	*Board feet.*	*Board feet.*	*Board feet.*
12	6,562	647	1,338	2,440
14	6,257	1,334	2,170	3,427
16	5,783	2,047	3,016	4,529
18	5,186	2,890	4,022	5,723

As a basis for the calculation of the returns from forests as an investment it has been assumed that cut-over land is worth $1 per acre. The value of the timber obtainable from all trees 12 inches and over in diameter breasthigh left standing has been calculated at $2.25 per thousand board feet. The annual cost of taxes and protection from fire and trespass has been estimated at 5 cents per acre. All calculations have been made at 3 per cent compound interest.

Table XIV shows that after Block I is cut over to a diameter limit of 15 inches, 570 board feet per acre will be left standing, and that at the end of 30 years the yield will be 2,634 feet. At the present stumpage rate of $2.25 per thousand feet these 2,634 feet will be worth $5.93, a net return on the original investment of 2½ per cent. If the stumpage rate should rise to $5, this second crop will be worth $13.17, a net return of 5¼ per cent.

Table XV shows that on the remainder of the tract a present cutting lower than 16 inches will not produce a second crop sufficiently large to be profitable, but that by cutting to 16 inches a second crop of 3,016 board feet can be had after 30 years; by cutting to 18 inches, 2,890 feet will be produced in 20 years, and under the same diameter limit 4,022 feet will be had in 30 years. By cutting to 16 inches, 779 board feet of merchantable timber will be left standing per acre. The second crop at the end of 30 years, valued at $2.25 per thousand feet, will be worth $6.79, a return on the original investment of 2½ per cent compound interest, and valued at $5 per thousand feet will be worth $15.08, a return of 5¼ per cent.

By cutting to an 18-inch diameter, 1,376 feet of merchantable timber will be left standing as part of the investment. The second crop at the end of 20 years, valued at $2.25 per thousand feet, will be worth $6.50, a return on the investment of 2 per cent, and valued at $5 per thousand feet will be worth $14.45, a return of 6 per cent. At the end of 30 years the second crop at $2.25 per thousand feet will be worth $9.05, a return of 2¼ per cent, and at $5 per thousand feet will be worth $20.11, a return of 5 per cent compound interest. A summary of these financial returns is given in Table XVI.

If the stumpage value of longleaf pine should remain stationary at $2.25 per thousand board feet for the next 30 years, it would not pay the lumber company to hold its lands for a second crop. If, however, it is assumed that a stand of longleaf pine which will yield at least 2,500 board feet per acre at the end of 20 years if cut to a limit of 12 inches in diameter breasthigh will be worth $5 per thousand feet on the stump, then it will be a good investment for the company to hold its lands for a second crop. The rise in stumpage values in the past, the rapid rate at which the existing supply of longleaf pine is being consumed, and the steadily increasing demand for it have led some of the

most conservative lumber companies in the South, among them the Kaul Lumber Company, to believe that it will be worth $5 on the stump within 20 years.

TABLE XVI.—*Value of cut-over longleaf pine land as an investment.*

BLOCK I, COOSA COUNTY TRACT.

Present cutting limit, diameter breast-high.	Merchantable timber left standing.		Stumpage per M board feet.	Future yields and rate of interest on capital invested.					
				After 20 years.			After 30 years.		
Inches.	*Board feet.*	*Value.*		*Board feet.*	*Value.*	*Interest, per cent.*	*Board feet.*	*Value.*	*Interest, per cent.*
15	570	$1.28	$2.25 5.00	.....	.....	.....	2,634	$5.93 13.17	2¼ 5¼

BLOCKS II, III, IV, V, AND VI, COOSA COUNTY TRACT.

16	779	$1.75	$2.25 5.00	.....	.....	.....	3,016	$6.79 15.08	2¼ 5¼
18	1,376	3.10	2.25 5.00	2,890	$6.50 14.45	2 6	4,022	9.05 20.11	2¼ 5

The company will, accordingly, be able to make money by raising a second crop, and can afford in the cutting of the present crop to exercise due care to leave the forest in a silvically good condition.

SELECTION OF A DIAMETER LIMIT.

On Block I cutting and boxing have already progressed so far that the cutting limit is fixed at 15 inches diameter breasthigh. Although on this block the second crop promises to yield a fair return on the investment, yet on the rest of the tract a higher limit will be productive of more satisfactory results.

To raise the diameter limit to 16 inches gives but slight improvement, but at an 18-inch diameter limit the improvement is marked. Only about 600 feet more timber per acre is left standing by raising the diameter limit from 16 to 18 inches, while the higher diameter limit secures a future yield of over 800 feet more at the end of 20 years and of over 1,000 feet more at the end of 30 years.

At the end of 20 years the future yield from a 16-inch diameter limit will not be large enough to be considered merchantable, while from an 18-inch diameter limit it will not only be large enough to be merchantable, but also to pay 6 per cent compound interest on the initial investment, in which is included 1,376 feet of timber left on the ground, worth $2.25 per thousand feet.

Thus far we have assumed all merchantable timber to be of equal value; but this is not correct. A factor of very considerable importance—one which has never before been reckoned with in dealing with longleaf pine—is the difference in value of lumber sawed from trees of different sizes.

Large trees, if sound, are worth more in proportion than small trees; that is, a thousand board feet sawed from large trees are worth more than an equal quantity of lumber sawed from small trees. This is true because large trees produce a higher proportion of the better grades of lumber. It is apparent, therefore, that the lumberman by holding his small trees until they reach a larger size gains in two ways—first, he secures a *quantity* increase, and, second, a *quality* increase.

Every tree has in it a considerable amount of lumber which is manufactured either at a very small profit, at no profit at all, or at an actual loss. The large trees carry a much smaller proportion of this dead weight than the small ones, yet the expense of handling all sizes of trees is reckoned as about the same. The lumberman would like to manufacture only profitable grades, but this is impossible. Hence he must use great efforts and be at considerable expense to find or create markets for the disposal of his least profitable, or wholly unprofitable, products.

Another consideration is the speculative feature of the lumber market. The most conservative lumbermen in the South are generally looking forward to an increase in the value of their products. This increase, when it comes, will almost certainly apply more extensively to the choice grades of lumber than to the common grades, because the scarcity of supply is always first apparent in a scarcity of the choice grades. The common grades have always been more or less plentiful; it is probable that southern lumbermen are obtaining as much for them now as they will for a long time.

In order to determine what trees are now most profitable to cut on the tract and what trees should be left, an experiment was made at the mill in Coosa County. Two men in the woods followed saw crews and marked and measured sound trees as they were felled. Each tree, and each log in that tree, received a separate number, which was chalked on both ends of the log with blue crayon. Thus 479^{3} indicated the third log from tree 479. The diameter breasthigh, the length, and the diameter of each log were measured. When these marked logs reached the mill the dimensions and the grade of each piece of lumber sawed from them were tallied. In this way the amount of each grade of lumber sawed from each marked log was learned, and by putting together the logs, totals for the trees were determined. By grouping all the trees of each diameter class, and dividing by the number of trees in each class, averages were struck.

The kinds of lumber into which different logs are sawed are determined in every mill largely by the character of the orders received from day to day. The mill at Hollins cuts regular stock sizes, but in addition it cuts special sizes when these are ordered. The sawing varies, therefore, according to the demands of the market. For example, one week a special effort is made to get out railroad timbers; the next week fewer railroad timbers and more rift flooring is sawed. The work of analyzing the grade sawed from marked trees at Hollins extended over a period of about six weeks and gave the results shown in Table XVII.

TABLE XVII.—*Average amount of lumber sawed from longleaf pine.*

Grades.	Diameter breasthigh, inches.						
	14.	15.	16.	17.	18.	19.	20.
	Board ft.	*Board ft.*	*Board ft.*	*Board ft.*	*Board ft.*	*Board ft.*	*Board ft.*
Rift flooring[a]	6.6	6.9	14.1	26.7	34.3	44.5	56.5
Flat flooring[b]	27.2	33.6	40.3	46.7	43.0	55.8	56.2
Finishing[c]	38.8	43.7	53.3	54.5	66.3	55.2	57.6
No. 1 common boards	10.2	20.0	25.7	37.6	50.9	57.7	60.4
No. 2 common boards	10.0	1.2	.1	.3	.6	0.0	4.0
Dimension[d]	92.6	91.7	99.1	117.7	137.5	148.7	147.8
S. S. E. timbers	11.2	10.5	10.7	13.3	13.6	14.2	13.2
R. R. timbers	00.0	00.0	1.0	1.6	3.0	2.6	9.8
Total	196.6	207.6	244.8	298.4	349.2	378.7	405.5

Grades.	Diameter breasthigh, inches.					
	21.	22.	23.	24.	25.	26.
	Board ft.	*Board ft.*	*Board ft.*	*Board ft.*	*Board ft.*	*Board ft.*
Rift flooring[a]	71.2	65.2	82.5	127.1	99.8	138.4
Flat flooring[b]	41.6	50.3	47.7	51.1	53.4	34.9
Finishing[c]	75.6	88.2	98.4	99.5	150.8	160.0
No. 1 common boards	86.2	88.1	119.8	97.5	115.5	141.3
No. 2 common boards	4.1	6.3	7.6	30.5	13.1	29.7
Dimension[d]	184.4	210.0	226.0	225.3	265.3	228.4
S. S. E. timbers	14.3	6.8	5.0	11.1	0.0	19.0
R. R. timbers	7.8	18.8	40.5	42.8	54.3	57.5
Total	485.2	533.7	627.5	684.9	752.2	809.2

[a] Includes all grades of heart and sap rift flooring.
[b] Includes all grades of flat flooring.
[c] Includes first and second clear, and third clear, finishing.
[d] Includes No. 1 common and No. 2 common dimension stuff.

A close scrutiny of this table will show that the amount of better grades advances with the growth of the tree more rapidly and much more regularly than that of the commoner grades. Any sound tree will turn out comparatively low-priced products, such as dimension, common boards, common flooring, and side square-edge timbers; but the tree must have reached some size before it will yield a considerable

quantity of rift flooring and railroad timbers. Rift flooring is obtained in small quantities from 14-inch and 15-inch trees; in the 16-inch class it doubles in quantity, and from there on there is a rapid and steady increase which far exceeds the rate of increase in the volume of the tree. Two exceptions occur, namely, in the 22-inch and 25-inch classes, where the amount of rift flooring drops slightly. But this is explained by the exceptional increase in amount of railroad timbers for these diameters, showing that part of what might have gone into rift flooring went into these timbers. Railroad timbers are not obtained in considerable quantity until the 22-inch diameter is reached; from that point a steady increase occurs. In the lower diameters the amount of railroad timbers drops slightly below the previous diameter in two places; this is explained by exceptional increases in rift flooring. Small trees yield more or less finishing; but as the diameter increases, more and more of what would have made finishing is put into rift flooring, *A* flat and *B* flat flooring, and railroad timbers, so that the increase is not nearly so rapid as it would otherwise be.

The next step is to convert these figures into money values. On request the company furnished a price list, which represents what at the time (February, 1904) were the average selling prices of its lumber, f. o. b. at the mill. In Table XVIII several different grades and dimensions of lumber, for simplicity's sake, have been combined under a few headings; but in the calculations to determine the money values of trees, each grade, and each dimension in that grade when it varied in price from other dimensions, was calculated separately. The grades obtained from trees of the various sizes were multiplied by the selling prices of the lumber, and the money value of the trees was thus determined. For example, an 18-inch tree, according to Table XVIII, yields 34.3 board feet of rift flooring worth from $14.50 to $34 per thousand feet; 43 feet of flat flooring worth from $8 to $16; 66.3 feet of finishing worth from $15 to $22.50; 50.9 feet of No. 1 common boards worth from $9.50 to $12.50; 0.6 of a foot of No. 2 common boards worth from $8.50 to $9.75; 137.5 feet of dimension worth from $9.50 to $16.25; 13.6 feet of S. S. E. timbers worth from $9 to $21.75; 3 feet of R. R. timbers worth from $11 to $23. Adding the amount of each grade gives the contents of the tree, 349 board feet; adding the value of the lumber of each grade gives the value of the tree, $4.65. If 349 feet from an 18-inch longleaf pine are worth $4.65, then the lumber sawed from that tree has an average value of $13.32 per thousand board feet. These results are shown in Table XVIII.

TABLE XVIII.—*Value of longleaf pine.*

Diameter breast-high.	Lumber sawed out.	Value per tree.	Value per M board feet.
Inches.	*Board-feet.*		
14	197	$2.32	$11.78
15	208	2.59	12.45
16	245	3.14	12.82
17	298	3.89	13.05
18	349	4.65	13.32
19	379	4.97	13.11
20	406	5.43	13.37
21	485	6.61	13.63
22	534	7.26	13.60
23	628	8.71	13.87
24	685	9.69	14.15
25	752	10.88	14.47
26	809	12.01	14.85

It will be noticed that while the table as a whole is consistent, there are two slight irregularities, namely, in the 19 and 22 inch classes. These were caused by the fact that in these two classes there chanced to be an unusually large number of trees which, when put through the saw, were found to contain defects not apparent in the log. In selecting trees everything was taken which did not show an advanced stage of red heart or contain very crooked logs. In tallying the lumber that came out of these trees it was assumed that the logs were sawed to the best advantage; if, for example, a siding that would have made a board 12 inches in width was ripped by the edgerman into two 6-inch boards, it was, nevertheless, tallied as a 12-inch board. No account was taken of lath made from slabs. With these exceptions, the table may be taken as approximately correct for the values of sound trees on the Coosa County tract. In order to determine the profits from these trees, the stumpage value, cost of logging, transportation, and manufacture must, of course, be deducted. Under favorable conditions these items do not exceed $7.75.

The table shows in figures a fact that is known only in a general way among lumbermen, namely, that the higher the cutting limit the higher the profit per thousand feet, but the lower the profit per acre. Cutting to a diameter limit of 16 inches would bring more profit per acre because it would remove more timber, but it would be taking some timber which, when sawed into lumber, would be worth at present about 50 cents a thousand feet less than that from 18-inch trees. In other words, the quality of the output would be lowered slightly in order to obtain a somewhat larger cut. If, on the other hand, trees under 18 inches in diameter are left to grow to a larger size, a second crop will be produced which, on a basis of quantity alone, will yield 6 per cent compound interest on the investment, and

besides, will yield better and more valuable grades. Thus, looking at the problem of what the forest will produce both in quantity and quality, the conclusions point strongly to 18 inches as the superior cutting limit.

SELECTION OF TREES TO BE CUT.

The diameter recommended should be taken as a general guide, subject to frequent modifications when forest conditions render it advisable. For example, it is obvious that cutting to an 18-inch diameter will leave more trees standing than would cutting to a 15-inch diameter, and consequently the number of cases where the limit must be raised in order to secure a sufficient basis for a second crop will be rare. On the other hand, there are cases where it will frequently be advisable to cut trees under 18 inches in diameter to improve the silvical condition of the forest. Modifications of the diameter limit recommended, unless they are made by a trained forester, will be dangerous. It is of the first importance not only that these modifications be made, but that they be made skillfully. To this end the supervision of the markings by a man of sufficient training to put their policy into good effect is essential.

Where the forest is pure longleaf pine, as on Block II and on the larger part of Blocks V and VI, the selection of trees for cutting should be governed by the density of the stand and the distribution of the diameter classes of the longleaf pine alone. Where all diameter classes, both above and below the cutting limit, are well represented and are evenly distributed, the 18-inch diameter limit should be closely followed.

Where the trees run so small that those 18 inches and over in diameter are scarce or entirely lacking, and where the stand is so dense that the trees are crowding each other and consequently losing in rate of growth, it will be wise to lower the diameter limit and to take out some of the dominant trees which are suppressing their neighbors, thus opening up the stand and increasing the rate of growth of the remaining trees. Where, on the other hand, the stand is open, consisting of only a few large trees per acre, and there are few or no trees under 18 inches in diameter, it will be a good plan to select a few sound and healthily growing trees over 18 inches in diameter, and to leave them to form part of the second crop.

In Blocks III and IV and in certain small portions of the other blocks, where the loblolly or shortleaf pines, especially of the smaller diameters, form an important part of the mixture, they, as well as the longleaf, should be considered in preparing for the second crop. Although their timber is less valuable than that of the longleaf, they grow at a more rapid rate and produce a larger yield per acre than the longleaf. Therefore, where the basis for a second crop of long-

leaf pine is small and that of the loblolly or shortleaf pine is large, it will be well in the cutting to encourage the development of these two pines as much as possible without hindering that of the longleaf pine.

To accomplish this it will be best to leave all longleaf pine under 18 inches in diameter and to cut all loblolly and shortleaf pines down to 14 inches in diameter.

RULES FOR MARKING AND CUTTING.

On whatever part of the tract lumbering is being done, the highest future yield will result only if the above recommendations for the selection of trees to be cut are carefully followed. All trees to be cut should be marked, and the sawyers should be required to follow the markings closely, to cut all marked trees, and to leave standing all unmarked trees. In felling and skidding they should exercise all possible care not to break down or otherwise injure any trees that are to be left standing.

The recommendations for cutting are summarized in the following set of rules:

1. All longleaf pine 18 inches and over in diameter breasthigh, except where variations in the character of the forest require a raising or lowering of the cutting limit, shall be marked for removal.

2. All loblolly and shortleaf pines 14 inches and over in diameter breasthigh shall be marked for removal.

3. Broken-topped, redheart, or otherwise defective trees of all diameters, which will pay the cost of removal, or can be utilized for ties, corduroy, skids, and so forth, shall be marked for removal.

4. No trees which are not marked shall be cut.

5. If use of small timber in logging is unavoidable, it shall be obtained not from scattered timber, but from dense thickets of young growth. For this purpose crooked, short-boled, defective, or otherwise unpromising trees shall be selected and marked, so that straight, thrifty trees may be left as the basis for future crops.

6. Each saw boss shall enforce care in felling so as not to break, scrape, or otherwise injure small trees; and he shall allow no bedding with small trees.

7. Tops shall be lopped flat to the ground at least 15 feet clear of unmarked trees, to avoid damage from slash fires.

A THIRD CROP—FIRE PROTECTION

After the removal of the second crop the number of trees left standing as a basis for a third crop will be insignificant. In order to obtain a third crop within a reasonable period after the harvesting of the second, it will be necessary to obtain a reproduction of the longleaf pine now. On some parts of the tract there is already present a

sufficient amount of young growth 2 years old. If the present cutting is carried on along the lines recommended there will be a sufficient number of trees to seed up such openings as are left in other parts of the forest.

In order, however, to enable this reproduction to develop to the best advantage into a third crop, it is absolutely necessary that fire be kept out of the tract. If rule No. 7 regarding the lopping of trees is observed, the danger from slash fires after the logging will be eliminated, but the damage from surface fires will still continue. Absolute protection from fire would undoubtedly prevent an annual loss of merchantable timber, and, by improvement of the soil, would increase the rate of growth, with the result of a larger future yield.

The tract is broken by interior holdings and cut up by public roads, which heighten the danger from fire. The maintenance of a force of rangers sufficient to patrol the tract thoroughly, to watch the boundaries of all the interior holdings and all the traveling upon the public roads, would be expensive. It would be necessary to employ at least five men permanently, and to pay them enough to enable them to devote their whole time to the work of patrol. At $400 per year apiece, the cost of maintaining this force of five men would amount to 6 cents per acre per year. The additional expense of hiring extra help to fight fires, which at first would undoubtedly occur frequently, would probably raise the annual cost per acre to nearly 10 cents.

If the whole area of 35,984 acres, with which this report deals, were owned in one solid block by the company and were crossed by no public roads, it is safe to make the estimate that the annual cost of absolute protection from fire would amount to less than 4 cents per acre, and that the raising of a third crop of pine would be feasible. In its present condition, however, the question of raising a third crop can not be considered.

THE BIBB COUNTY TRACT.

SITUATION.

The Bibb county tract occupies the high land which forms the divide between the Cahaba River on the east, on which is located Centerville, and which is a tributary of the Alabama, and, on the west, the Black Warrior, or Tuscaloosa River, which flows by Tuscaloosa and Moundville into the Tombigbee. The total area of the tract is 70,588 acres. It comprises, wholly or in part:

Sections 7 to 36, inclusive, of township 23 north, range 6 east; sections 1 to 36, inclusive, of township 23 north, range 7 east; sections 6, 7, 18, 19, 30, and 31 of township 23 north, range 8 east; sections 1 to 18, 20 to 29, and 34 to 36, inclusive, of township 22 north, range 7 east; sections 5 to 8, 17 to 20, and 29 to 32, inclusive, of township 22 north, range 8 east.

Township 23 north, range 6 east, occupies the northeast corner of Hale County. Township 23 north, range 7 east and range 8 east, and township 22 north, range 8 east, and the northern half of township 22 north, range 7 east, are in Bibb County. The southern half of township 22 north, range 7 east, is in Perry County.

Moundville, on the Alabama Great Southern Railroad, is about 6 miles west of the west boundary line of township 22 north, range 6 east. A branch line of the Mobile and Ohio, which crosses the Alabama Great Southern at Tuscaloosa and runs southeast to Montgomery, passes through township 24 north, range 7 east, about 2 miles north of the boundary of township 23 north, range 7 east. Centerville, the county seat of Bibb County, is located on this road about 12 miles due east from the east boundary line of township 23 north, range 7 east. The distance from Birmingham to Moundville via the Alabama Great Southern Railroad is about 65 miles.

TOPOGRAPHY.

These townships are situated in what Dr. Charles Mohr calls the "Central Belt of Longleaf Pine," which crosses the State almost centrally in a southeastern and northwestern direction from Russell County, on the east, to a short distance west of Tuscaloosa County, varying in width from about 10 to a little over 35 miles. The geological formation is sedimentary and is made up of "the Tuscaloosa or Lowermost Cretaceous, a great fresh-water formation consisting of sands, clays, and pebble beds. Over this Tuscaloosa formation there is the usual mantle of red loam and pebbles of the Lafayette, which is distributed over the entire coastal plain."[a] In this particular part of the central pine belt the loam is lacking and is replaced by a quartz sand, occasionally slightly loamy, and in many places plentifully intermixed with quartz pebbles, but almost universally stained with iron oxide.

The country has in the course of time become very much eroded, and now consists for the most part of a confused and irregular mass of steep ridges, capped with broken layers of the above-mentioned sandstone, and rising from 200 to 400 feet above the general level of the country. Some ridges are long and winding, with many spurs running out from them, and others form small independent hills. (See Pl. III, fig. 1.) In a few instances the tops are broad and flat, forming miniature plateaus, but, as a rule, they are narrow and rounded, often hardly wide enough for a wagon road.

In those localities where the scarcity of iron in the soil and the absence of a clay or hardpan subsoil has prevented the formation of the sandstone, the erosion has been more regular and the topography has assumed a rolling character.

[a] Prof. E. A. Smith, State geologist of Alabama.

The valleys of the smaller creeks and branches are usually steep and narrow; those of the larger streams are generally rather broad and only gently sloping or almost level. The elevation of the highest ridges is nearly 600 feet above sea level; that of the bottoms of the larger creeks is about 250 feet.

The four principal creeks which drain the tract are Little Sandy and Elliott, which flow west into the Black Warrior River, and Affonee and Blue Gut creeks, whose general direction is southeast into the Cahaba. None of these attains a width of more than 20 or 25 feet before leaving the tract.

SOIL.

The soil in Bibb County is but little suited to agriculture, being far poorer and less productive than that of Coosa County. Lighter and more sandy, it is less fertile and, on the removal of the forest cover, is quicker to lose its fertility. On the slopes it washes and gullies much more readily. The result is that on the Bibb County tract there is a larger proportion of worn-out and abandoned farm land, in all the various stages of reversion to forest, than on the Coosa County tract. It is likely that in the future this proportion will increase rather than diminish.

THE FOREST.

Settlement on the Bibb County tract began over eighty years ago, but the land in general is so unsuited for farming that the greater part of the 70,588 acres, namely, 62,789 acres, or 88.9 per cent, still remains under forest. The lack of railroads has prevented the development of large lumbering enterprises, and the cutting of timber has been confined to the supply for one or two small mills, so that in spite of its long-continued use as a public range, and the effect of the fires set to improve it as such (see Pl. III, fig. 2), the forest is practically virgin. In general character it is much the same as that in Coosa County, and the same two main types, the longleaf pine land and the creek land, have been distinguished, but there are minor points of difference which should be considered.

Forest Types.

LONGLEAF PINE LAND.

The longleaf pine land covers 55,159 acres, 87.8 per cent, of the forested area, or 78.1 per cent of the whole tract. As in Coosa County, the greater part of the type consists of a pure open stand of longleaf pine, but in certain localities where the soil is more loamy, particularly in sections 7, 18, 19, 30, and 31 of township 23 north, range 6 east, sections 4, 5, 6, 7, 17, and 18 of township 23 north, range 7 east, and sections 27 and 34 of township 22 north, range 7 east, the shortleaf,

loblolly, and hardwoods mix with the longleaf and sometimes replace it entirely. On the northern and western exposures there is often considerable hardwood undergrowth.

The principal silvical difference in the longleaf pine lands of the two tracts seems to be in the longleaf pine itself. On the thin, dry soil of the steep slopes and tops of the high ridges the tree is just as slow-growing and stunted as on similar situations in Coosa County; but on the deep soil of the more moderate lower slopes, and in the rolling country, it reaches larger dimensions, both in height and in diameter, than on any part of the other tract. (See Pl. IV.)

Table XIX gives the height of these trees on a basis of diameter breasthigh, and was computed from the hypsometer measurements of 462 of the best trees found in township 23 north, range 6 east.

TABLE XIX.—*Height of longleaf pine, Bibb County tract.*

Diameter breast-high.	Total height.	Diameter breast-high.	Total height.	Diameter breast-high.	Total height.	Diameter breast-high.	Total height.
Inches.	*Feet.*	*Inches.*	*Feet.*	*Inches.*	*Feet.*	*Inches.*	*Feet.*
1	14	11	90	21	118	31	128
2	23	12	95	22	120	32	130
3	32	13	99	23	121	33	131
4	40	14	103	24	122	34	133
5	49	15	107	25	123	35	134
6	57	16	109	26	123	36	136
7	64	17	112	27	124	37	137
8	71	18	114	28	125	38	139
9	78	19	115	29	126	39	140
10	84	20	117	30	127	40	142

The stand of trees and the estimated yield in board feet are also somewhat better here than on the Coosa County tract, in spite of the fact that redheart, which is so rare in Coosa County, is here so common that the timber cruisers made a reduction of 500 feet to the acre in their estimates on account of it. It seems to be commonest in the best timber. The stand and yield will be considered in detail in the block description.

CREEK LAND.

The creek land occupies 7,630 acres, 12.2 per cent of the forested area, or 10.8 per cent of the whole tract. White and cow oak, and tulip tree of merchantable quality, are wanting entirely, and in point of actual numbers are far less common than in Coosa County. On the other hand, the proportion in the mixture of loblolly pine and the magnolias, particularly the sweet and the large-leaved magnolia, is larger.

The most noticeable difference in the creek land of the two tracts is in the undergrowth. The stink-bay (*Illicium floridanum*), which in Coosa County is found only in a few small isolated clumps, on the

Bibb County tract forms dense thickets covering extensive areas along the bottoms of the larger creeks. Along the South Fork of Little Sandy, which rises in section 31 of township 23 north, range 7 east, and flows almost due north through sections 30, 19, and 18, joining the main stream in the southwest corner of section 7, there is a great deal of canebrake, which in some places forms dense, almost impenetrable thickets over a quarter of a mile in width.

UNWOODED LAND.

The unwooded land has a total area of 7,799 acres, 11.1 per cent of the whole tract. As shown on the map, it is confined mainly to the level or gently sloping land along the water courses on what was formerly creek land. It is only in the rolling country, namely, the northwestern part of township 23 north, range 6 east, and in the northeastern part of township 23 north, range 7 east, where the tops are broad and the slopes moderate, that farming has been attempted on the longleaf pine land. Only a very small percentage of the area under cultivation—a few spots in the bottoms of the larger valleys—can be termed agricultural land. It is only a question of time before the rest of the cleared land will have to be given up.

DIVISION INTO BLOCKS.

The Bibb County tract has been divided into blocks for the same general reasons as was the Coosa County tract. In the following descriptions the creek type is not taken into account, except that its area and average stand and yield per acre in each block are given. As in Coosa County, its proportional area and yield in merchantable pine are so small as to be hardly worth considering.

THE STAND BY BLOCKS.

Block I comprises T. 23 N., R. 6 E., sections 7, 18, 19, 30, 31, and 32. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	2,565	66.9
Creek land	191	5.0
Unwooded land	1,075	28.1
Total	3,831	100.0

Although the land in these sections is moderately hilly, there is very little of the sandstone formation. The soil is deep and is slightly loamy. In consequence the loblolly and shortleaf pines play an important part in the forest on the longleaf pine land. Except in the eastern half of sections 18 and 19, there are practically no stands of pure longleaf. In many places it is entirely superseded by the loblolly and shortleaf, of which the number of small trees under 12 inches in diameter is large. The present yield of merchantable longleaf pine on this block is small.

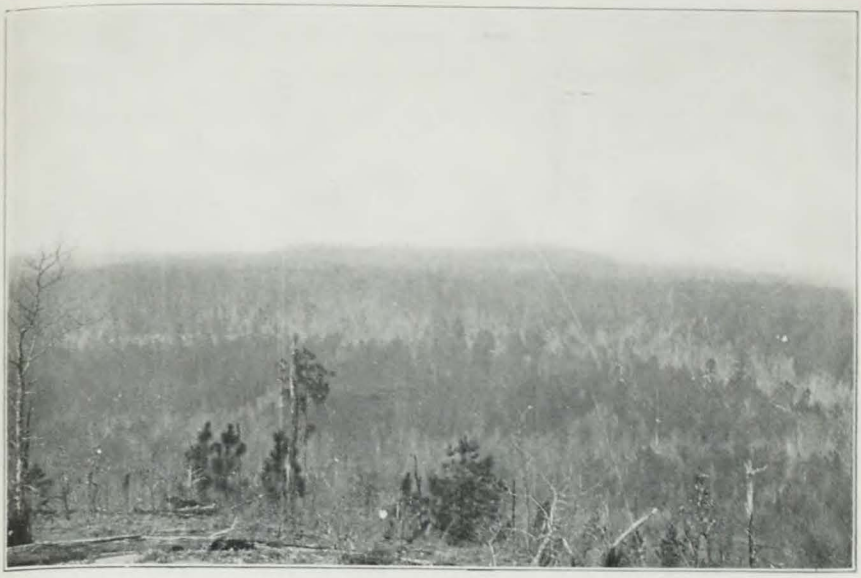

FIG. 1.—THE FOREST FROM TOP OF HIGH HILL IN SOUTHEASTERN PART OF BIBB COUNTY TRACT.

FIG. 2.—LONGLEAF PINE LAND ON FIRE. TREE IN CENTER OF PICTURE IS BURNING AT THE BASE.

FIG. 1.—THE BEST TIMBER ON THE BIBB COUNTY TRACT.

FIG. 2.—POOR GROWTH OF LONGLEAF PINE ON A HIGH RIDGE, BIBB COUNTY TRACT.

Table XX shows the average stand per acre of the three pines on longleaf pine land, and of the three pines and the more important hardwoods on creek land.

TABLE XX.—*Present stand on Block I, Bibb County tract.*

Diameter, breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 112 acres).			Creek land (average of 14.4 acres).							
	Loblolly pine.	Shortleaf pine.	Longleaf pine.	Loblolly pine.	Shortleaf pine.	Longleaf pine.	White oaks.	Black oaks.	Red gum.	Yellow poplar.	Other hardwoods.
Inches.											
1	.....	.....	0.19	.....	.....	0.72	.....	.....	.....	.....	.....
2	.....	.....	.22	.....	.....	.93	.....	.....	.....	.....	.....
3	.....	.....	.21	.....	.....	.57	.....	.....	.....	.....	.....
4	.....	.....	.26	.....	.....	.43	.....	.....	.....	.....	.....
5	.....	.....	.26	.....	.....	.21	.....	.....	.....	.....	.....
6	5.26	6.31	.35	5.78	0.07	.07	.....	.....	.....	.....	.....
7	4.02	4.08	.46	3.77	.14	.....	.....	.....	.....	.....	.....
8	4.15	3.48	.45	3.91	.22	.07	.....	.....	.....	.....	.....
9	2.98	2.19	.46	2.77	.07	.07	.....	.....	.....	.....	.....
10	2.15	1.59	.40	2.42	.21	.07	0.36	0.42	1.71	0.21	5.64
11	2.00	1.21	.42	1.85	.14	.....	.42	.36	1.21	.21	1.64
12	1.36	.93	.58	1.71	.....	.....	.07	.36	.57	.29	1.79
13	1.19	.68	.46	1.35	.....	.07	.21	.29	.64	.36	1.14
14	.83	.50	.38	.83	.07	.....	.07	.14	.36	.07	.93
15	.58	.47	.67	1.07	.07	.....	.14	.07	.57	.07	.71
16	.46	.31	.43	.50	.07	.....	.....	.07	.29	.07	.71
17	.21	.18	.40	.50	.07	.14	.07	.....	.07	.07	.14
18	.35	.20	.46	.67	.07	.28	.....	.....	.14	.07	.14
19	.18	.17	.47	.50	.07	.....	.....	.....	.07	.14	.21
20	.25	.13	.45	.28	.....	.07	.....	.....	.07	.07	.42
21	.06	.09	.43	.64	.....	.07	.....	.14	.14	.07	.07
22	.04	.31	.33	.50	.....	.....	.07	.07	.21	.....	.....
23	.04	.14	.41	.36	.....	.14	.14	.....	.14	.07	.07
24	.02	.13	.33	.21	.07	.....	.....	.....	.07	.14	.14
25	.03	.13	.29	.21	.08	.....	.....	.....	.....	.07	.....
26	.02	.04	.25	.28	.....	.....	.....	.....	.....	.....	.....
27	.03	.05	.25	.07	.....	.....	.....	.....	.....	.....	.....
28	.02	.03	.20	.43	.....	.07	.....	.....	.....	.07	.....
29	.03	.01	.08	.....	.....	.....	.....	.....	.....	.....	.....
30	.....	.03	.13	.....	.....	.....	.....	.....	.....	.....	.....
31	.....	.....	.09	.....	.....	.....	.....	.....	.....	.....	.....
32	.....	.....	.04	.....	.....	.....	.....	.....	.....	.....	.....
33	.....	.....	.05	.....	.....	.....	.....	.....	.....	.....	.....
34	.....	.....	.03	.....	.....	.....	.....	.....	.....	.....	.....
35	.....	.....	.02	.07	.....	.....	.....	.....	.....	.....	.....
36	.....	.....	.....	.07	.....	.....	.....	.....	.....	.....	.....
37	.....	.....	.....	.07	.....	.....	.....	.....	.....	.....	.....
Total.	.....	.....	10.91	.....	.....	3.98	.....	.....	.....	.....	.....
TREES 10 INCHES AND OVER IN DIAMETER, BREASTHIGH.											
Total.	9.85	7.33	8.05	14.59	0.92	0.91	1.55	1.92	6.26	2.05	13.75
Per cent.	39.04	29.05	31.91	34.78	2.19	2.17	3.69	4.58	14.92	4.89	32.78

The total yield of the three pines on the whole of this block is—

	Board feet.
Cutting to a limit of 12 inches in diameter breasthigh ..	12,649,000
Cutting to a limit of 14 inches in diameter breasthigh ..	11,729,000
Cutting to a limit of 16 inches in diameter breasthigh ..	10,659,000
Cutting to a limit of 18 inches in diameter breasthigh ..	9,686,000

The average yield per acre of each pine on each type may be found in Tables XXVII and XXVIII.

Block 11 comprises sections 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17, T. 23 N., R. 6 E. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	5,293	85.9
Creek land	386	6.3
Unwooded land	479	7.8
Total	6,158	100.0

In the western part of the block the topography is rolling. There is little or no rock. The soil is a pure sand, very deep and dry. The water courses are mostly intermittent, flowing only during seasons of wet weather. In consequence the proportion of creek type on this block is small, and the longleaf pine is often found growing in the hollows as well as on the slopes and ridges. The stand of longleaf pine is pure and there is very little hardwood undergrowth. It is on this part of the tract that the longleaf pine reaches its best development. (Compare Table XIX.)

Toward the east, with the appearance of the sandstone, the topography becomes gradually rougher, the slopes steeper, and the ridges more sharply defined. On the westerly and northerly exposures hardwoods and a few loblolly and shortleaf pines sometimes occur in mixture with the longleaf. Of the last, trees of the smaller diameter classes, namely, under 15 inches in diameter breasthigh, are somewhat more common than in the western part of the block. In the northern part of the block, during the past few years, timber has been cut and taken out to the railroad from the following forties:

Section 9—NW. of NE.; NE. of SE.; SE. of NW.; SW. of NW.
Section 10—NE. of NE.; SE. of NE.
Section 11—SE. of SE. and all of SW. except SW. of SW.

The cutting has been to diameter limits of from 15 to 16 inches.

In section 9, owing to the lack of trees of the smaller diameter classes, the logging has resulted in a clean cut, but in sections 10 and 11, where the proportion in the stand of trees under 15 inches is unusually large, the cutting has simply removed the largest and best timber, which was pretty evenly distributed among the small stuff, and the forest would have been left in a good condition to produce a second crop if it had not been for the slash fires after the logging, which in some places have killed all the pines left standing. The area, however, which has been damaged by the logging and slash fires is comparatively small, and the average stand and yield per acre is good, as is shown in the following tables.

Table XXI gives the average stand per acre of the three pines on

longleaf pine land, and of the three pines and the more important hardwoods on creek land.

TABLE XXI.—*Present stand on Block II, Bibb County tract.*

Diameter breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 296 acres).			Creek land (average of 22 acres).							
	Long-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Long-leaf pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1	0.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	1.14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	1.55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	1.88	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	1.91	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	1.89	0.66	0.47	2.00	0.41	.....	.....	.....	.....	.....	.....
7	1.79	.55	.39	1.45	.18	.....	.....	.....	.....	.....	.....
8	1.73	.51	.29	1.45	.....	0.05	.....	.....	.....	.....	.....
9	1.84	.38	.21	1.00	.09	.....	.....	.....	.....	.....	.....
10	1.75	.31	.20	1.18	.14	.05	0.32	0.91	1.18	0.18	1.64
11	1.71	.33	.19	1.41	.18	.05	.18	.55	1.18	.27	1.59
12	1.67	.18	.12	.91	.05	.05	.45	.41	.77	.36	.95
13	1.67	.19	.03	.55	.09	.05	.09	.50	.45	.18	1.18
14	1.71	.13	.07	.73	.14	.....	.27	.32	.36	.23	1.05
15	1.60	.09	.04	.45	.14	.05	.23	.36	.32	.23	.41
16	1.55	.07	.04	.55	.09	.....	.....	.18	.18	.09	.55
17	1.41	.06	.03	.59	.....	.....	.14	.09	.14	.09	.32
18	1.36	.04	.01	.36	.05	.....	.14	.23	.09	.18	.36
19	1.27	.02	.03	.50	.05	.05	.23	.23	.....	.18	.32
20	1.17	.02	.01	.36	.....	.05	.05	.09	.05	.05	.18
21	1.19	.03	.01	.55	.....	.05	.09	.09	.14	.09	.18
22	1.22	.01	.03	.50	.05	.05	.18	.....	.05	.18	.14
23	1.05	.01	.02	.36	.....	.05	.....	.09	.09	.....	.05
24	.84	.....	.01	.18	.....	.....	.09	.09	.05	.05	.....
25	.74	.....	.01	.09	.....	.....	.....	.05	.05	.....	.....
26	.63	.01	.....	.09	.....	.....	.14	.....	.....	.....	.05
27	.47	.....	.....	.09	.....	.05	.....	.....	.....	.....	.09
28	.32	.....	.....	.....	.05	.....	.....	.05	.05	.05	.....
29	.29	.....	.....	.09	.....	.05	.....	.05	.....	.....	.05
30	.31	.01	.....	.23	.....	.....	.05	.....	.05	.09	.....
31	.18	.....	.....	.23	.....	.....	.....	.....	.....	.....	.....
32	.19	.....	.....	.09	.....	.....	.....	.....	.....	.05	.....
33	.09	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
34	.07	.01	.....	.09	.....	.....	.05	.....	.....	.....	.....
35	.03	.....	.....	.05	.....	.....	.....	.....	.....	.....	.....
36	.02	.....	.....	.05	.....	.....	.....	.....	.....	.....	.....
37	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
38	.01	.....	.....	.05	.....	.....	.....	.....	.....	.....	.....
39	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.	38.79	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TREES 10 INCHES AND OVER IN DIAMETER, BREASTHIGH.											
Total.	24.56	1.52	0.85	10.33	1.03	0.60	2.70	4.29	5.20	2.55	9.11
Per cent.	91.20	5.64	3.16	28.84	2.88	1.68	7.54	11.98	14.52	7.12	25.44

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The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches in diameter breasthigh	41,582,000
Cutting to a limit of 14 inches in diameter breasthigh	40,127,000
Cutting to a limit of 16 inches in diameter breasthigh	37,126,000
Cutting to a limit of 18 inches in diameter breasthigh	34,415,000

The average yield per acre of each pine on each type may be found in Tables XXVII and XXVIII.

Block III comprises sections 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 33, 34, 35, and 36 of T. 23 N., R. 6 E. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	6,832	78.7
Creek land	816	9.4
Unwooded land	1,032	11.9
Total	8,680	100.0

Throughout the block the land is hilly, the slopes are comparatively steep, and the ridges well defined. The majority of the longleaf pine land supports a pure stand of longleaf, but there are many small scattered patches where the loblolly, shortleaf, and hardwoods occur in mixture with it. In consequence the stand table for this block shows a slightly larger number of the loblolly and shortleaf pines per acre than does the table for Block II. The number per acre of longleaf pines also is a trifle larger, which makes the yield in board feet a little higher.

Cutting has been confined to two or three forties in the northwest corner of section 32 in Block I.

Table XXII gives the average stand per acre of the three pines on the longleaf pine land and of the three pines and some of the more important hardwoods on the creek land.

TABLE XXII.—*Present stand on Block III, Bibb County tract.*

Diameter breasthigh.	Number of trees per acre.										
	Longleaf pine land (average of 332 acres).			Creek land (average of 48 acres).							
	Long-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Long-leaf pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1	0.50					0.08					
2	.86					.08					
3	1.16					.02					
4	1.66					.04					
5	1.73					.06					
6	1.65	1.07	0.60	2.63	0.33	.10					
7	1.59	.93	.60	2.21	.21	.04					
8	1.57	.83	.49	1.73	.33	.04					
9	1.58	.57	.36	1.44	.10	.06					
10	1.70	.58	.24	1.31	.21	.08	0.38	0.46	0.79	0.31	3.27
11	1.66	.38	.18	1.46	.10	.02	.38	.52	.56	.31	2.42
12	1.69	.29	.21	.88	.10	.06	.33	.44	.38	.25	1.94
13	1.69	.23	.15	1.08	.04	.06	.35	.33	.31	.21	1.54
14	1.81	.10	.15	.71	.10	.10	.29	.08	.31	.13	1.31
15	1.81	.11	.11	.94	.04	.06	.25	.13	.19	.29	1.00
16	1.64	.08	.07	.85		.06	.19	.19	.31	.08	.54
17	1.56	.05	.05	.67	.06	.04	.10	.17	.21	.08	.63
18	1.60	.06	.03	.52	.02	.04	.15	.02	.15	.02	.23
19	1.41	.04	.02	.56		.08	.10	.06	.08	.02	.46
20	1.46	.04	.04	.42	.02		.06	.02	.04	.10	.19
21	1.27	.02	.02	.46	.04	.02	.13	.02	.06	.04	.13
22	1.20	.03	.04	.40		.06	.06	.02	.10	.13	.08
23	1.12	.03	.02	.19	.04		.21	.02	.10	.06	.10
24	1.04	.02	.04	.31	.02	.02	.06	.02	.02		.08
25	.79	.01	.02	.19		.02	.02		.13	.02	.06
26	.65	.02	.01	.19	.02	.02	.02		.04	.02	
27	.49	.01	.02	.04		.02			.02	.06	.02
28	.41	.01	.02	.06	.04	.02	.04				.02
29	.28	.01	.01	.10		.02			.02		
30	.26	.01		.08		.02				.04	
31	.12	.01	.01	.08	.02	.04	.04				
32	.11	.01		.08		.02	.02		.02	.10	
33	.07	.01		.04	.02						
34	.02			.06	.02						
35	.03			.02							
36	.02			.13						.02	
37				.02						.02	
38	.01										
39											
40											
41										.02	
45				.02							
Total	38.22					1.40					
TREES 10 INCHES AND OVER IN DIAMETER BREASTHIGH.											
Total	25.92	2.16	1.46	11.87	0.91	0.88	3.18	2.50	3.84	2.33	14.02
Per cent.	87.75	7.31	4.94	30.03	2.30	2.23	8.05	6.32	9.71	5.89	35.47

The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches in diameter breasthigh..	59,684,000
Cutting to a limit of 14 inches in diameter breasthigh..	57,557,000
Cutting to a limit of 16 inches in diameter breasthigh..	53,863,000
Cutting to a limit of 18 inches in diameter breasthigh..	49,143,000

The average yield per acre of each pine on each type may be found in Tables XXVII and XXVIII.

Block IV comprises sections 4, 5, 6, 7, 17, and 18 of T. 23 N., R. 7 E. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	2,713	71.3
Creek land	783	20.6
Unwooded land	309	8.1
Total	3,805	100.0

In this block the character of the forest on the longleaf pine land is somewhat similar to that of Block I. In point of numbers the loblolly and shortleaf pines of the smaller diameter classes predominate over the longleaf. Of the trees of merchantable size (12 inches and over in diameter) the proportion of longleaf is greater than that of the other pines, but the yield per acre in board feet is low. As regards the present yield and the possibilities of future yields of longleaf pine, Block IV has only a little more value than Block I. The second crop promises to be composed almost entirely of loblolly and shortleaf pine.

Table XXIII gives the average stand per acre of the three pines on longleaf pine land and of the three pines and the more important hardwoods on creek land.

TABLE XXIII.—*Present stand on Block IV, Bibb County tract.*

Diameter breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 140 acres).			Creek land (average of 48 acres).							
	Lob-lolly pine.	Long-leaf pine.	Short-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Long-leaf pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1	.....	0.37	.....	.....	.....	0.08	.....	.....	.....	.....	.....
2	.....	.68	.....	.....	.....	.08	.....	.....	.....	.....	.....
3	.....	1.19	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	.....	1.44	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	.....	1.56	.....	.....	.....	.06	.....	.....	.....	.....	.....
6	5.06	1.56	1.41	3.60	0.19	.06	.....	.....	.....	.....	.....
7	4.22	1.46	1.02	2.79	.08	.....	.....	.....	.....	.....	.....
8	3.85	1.74	.90	3.29	.08	.02	.....	.....	.....	.....	.....
9	2.82	1.50	.53	2.38	.....	.....	.....	.....	.....	.....	.....
10	2.44	1.52	.39	2.38	.06	.....	0.23	0.75	0.98	0.29	2.85
11	2.04	1.65	.41	2.27	.04	.04	.40	.63	1.40	.33	2.48
12	1.52	1.75	.31	1.19	.02	.04	.17	.58	.67	.38	1.60
13	1.23	1.46	.26	1.35	.02	.04	.17	.35	.71	.31	1.23
14	.89	1.48	.17	1.17	.02	.....	.15	.35	.25	.19	1.02
15	.63	1.38	.14	1.00	.....	.....	.23	.21	.31	.19	1.08
16	.36	1.58	.13	.50	.04	.02	.04	.25	.25	.10	.60
17	.25	1.38	.11	.73	.04	.....	.10	.13	.06	.15	.38
18	.19	1.24	.04	.69	.02	.....	.06	.19	.08	.06	.25
19	.15	.94	.05	.54	.02	.....	.06	.19	.04	.10	.23
20	.07	.80	.04	.21	.....	.02	.08	.08	.10	.02	.17
21	.11	.96	.06	.46	.....	.....	.08	.04	.06	.....	.19
22	.09	.72	.04	.29	.....	.....	.06	.02	.01	.13	.10
23	.04	.58	.03	.38	.....	.....	.02	.04	.02	.02	.15
24	.01	.41	.02	.23	.....	.....	.13	.08	.....	.02	.02
25	.01	.31	.02	.17	.....	.....	.06	.06	.04	.04	.08
26	.01	.34	.03	.15	.02	.....	.06	.....	.04	.06	.02
27	.01	.19	.....	.17	.....	.....	.02	.....	.....	.04	.....
28	.01	.23	.01	.10	.....	.02	.04	.....	.....	.04	.04
29	.01	.11	.....	.15	.....	.....	.06	.02	.02	.....	.....
30	.....	.05	.01	.06	.....	.....	.....	.....	.02	.....	.....
31	.01	.10	.01	.06	.....	.....	.04	.....	.02	.02	.....
32	.....	.08	.....	.04	.....	.....	.02	.....	.02	.....	.....
33	.01	.04	.....	.....	.....	.....	.02	.....	.02	.....	.....
34	.....	.05	.....	.04	.....	.....	.....	.....	.02	.....	.....
35	.....	.01	.....	.02	.....	.....	.02	.....	.....	.04	.....
36	.....	.01	.....	.02	.....	.....	.....	.....	.....	.....	.....
37	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
38	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
45	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
52	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
Total ..	.....	30.87	.....	.....	.....	.48	.....	.....	.....	.....	.....
TREES 10 INCHES AND OVER IN DIAMETER BREASTHIGH.											
Total ..	10.09	19.37	2.28	14.45	.30	.18	2.32	3.97	5.19	2.53	12.49
Per cent.	31.79	61.03	7.18	34.88	.72	.43	5.60	9.58	12.53	6.11	30.15

The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches in diameter breasthigh..	17,614,000
Cutting to a limit of 14 inches in diameter breasthigh..	16,295,000
Cutting to a limit of 16 inches in diameter breasthigh..	14,569,000
Cutting to a limit of 18 inches in diameter breasthigh..	12,448,000

The average yield per acre of each pine on each type may be found in Tables XXVII and XXVIII.

Block V comprises sections 1, 2, 3, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, and 36, T. 23 N., R. 7 E., and sections 6, 7, 18, 19, 30, and 31, T. 23 N., R. 8 E. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	18,279	79.8
Creek land	3,052	13.3
Unwooded land	1,568	6.9
Total	22,899	100.0

The whole block is rough and hilly. On the slopes and summits of all the ridges the sandstone is much in evidence.

On the longleaf pine land the greater part of the stand is pure longleaf. Hardwood undergrowth, except on the northern and western exposures, occurs only scatteringly, or is lacking entirely. The proportional area where the loblolly and shortleaf pine are at all prominent in the mixture is small.

No saw timber has been or is being cut, but in the northeastern part of the block, on some of the small private holdings, the longleaf pine is being hewed into ties. On many of the summits the timber is apt to be short and stunted.

The average number of longleaf pine trees per acre for the whole block is larger than for any other part of the tract, and in consequence the yield in feet board measure is higher. The individual trees, however, do not attain such a fine development as in the western part of Block II.

Table XXIV gives the average stand per acre of the three pines on longleaf pine land and of the three pines and the more important hardwoods on creek land.

TABLE XXIV.—*Present stand on Block V, Bibb County tract.*

Diameter breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 790 acres).			Creek land (average of 124.4 acres).							
	Long-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Lob-lolly pine.	Long-leaf pine.	Short-leaf pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1	0.78										
2	1.49				0.03						
3	2.24				.02						
4	2.50				.09						
5	2.61				.05						
6	2.52	0.84	0.28	2.86	.10	0.12					
7	2.43	.73	.26	2.45	.07	.10					
8	2.46	.69	.22	1.39	.13	.10					
9	2.42	.60	.21	1.82	.13	.12					
10	2.40	.54	.17	1.91	.08	.06	0.35	0.47	1.14	0.20	2.77
11	2.42	.42	.13	1.65	.07	.10	.19	.54	1.27	.23	3.09
12	2.45	.36	.11	1.56	.06	.04	.15	.52	.98	.27	1.89
13	2.32	.32	.07	1.29	.13	.04	.22	.35	.71	.18	1.02
14	2.23	.24	.06	1.10	.10	.01	.22	.47	.56	.16	.85
15	2.27	.19	.04	1.04	.06	.06	.15	.22	.44	.20	.77
16	2.03	.12	.04	.90	.05		.14	.17	.35	.13	.55
17	2.00	.10	.04	.89	.06	.01	.06	.13	.22	.06	.35
18	2.06	.08	.04	.90	.08	.03	.07	.15	.10	.13	.29
19	1.75	.06	.02	.72	.06	.01	.10	.06	.10	.06	.20
20	1.61	.06	.02	.84	.08	.01	.12	.08	.08	.04	.23
21	1.52	.03	.02	.59	.07	.01	.06	.04	.10	.07	.11
22	1.33	.02	.02	.59	.05	.01	.04	.06	.11	.06	.04
23	1.19	.02	.02	.42	.08	.01	.07	.01	.06	.02	.05
24	1.04	.02	.01	.43	.04	.01	.01	.03	.08	.08	.01
25	.84	.01	.01	.25	.06	.01	.03	.03	.02	.06	.04
26	.63	.01	.01	.18	.06		.01	.01		.01	.01
27	.52		.01	.10	.05	.02	.01	.01	.01	.01	
28	.43		.01	.06	.03		.01		.01	.02	.01
29	.31		.01	.07	.06			.01	.01	.02	.02
30	.24			.09	.04					.01	.01
31	.16		.01	.02	.03		.01		.01	.03	
32	.13			.05	.02					.01	
33	.07			.04	.01						
34	.06			.01	.01	.01			.01	.02	
35	.02			.02	.02						
36	.01			.01	.01						
37	.01			.01							
38	.01			.02							
39										.01	
40				.01							
41				.01							
42				.01							
43											
44				.01	.01						
45										.01	
Total.	51.51										
TREES 10 INCHES AND OVER IN DIAMETER BREASTHIGH.											
Total.	32.06	2.60	0.87	15.80	1.48	0.45	2.02	3.26	6.37	2.10	12.31
Per cent.	90.23	7.32	2.45	36.08	3.38	1.03	4.61	7.44	14.55	4.80	28.11

The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches in diameter breasthigh	181,603,000
Cutting to a limit of 14 inches in diameter breasthigh	161,042,335
Cutting to a limit of 16 inches in diameter breasthigh	150,509,286
Cutting to a limit of 18 inches in diameter breasthigh	145,589,000

The average yield per acre of each pine on each type may be found in Tables XXVII and XXVIII.

Block VI comprises sections 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 28, and 29 of T. 22 N., R. 7 E., and sections 5, 6, 7, 8, 17, and 18 of T. 22 N., R. 8 E. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	13,384	75.9
Creek land	1,723	9.8
Unwooded land	2,513	14.3
Total	17,620	100.0

The general character of this block is similar to that of Block V. There is a slightly larger proportion of loblolly and shortleaf pine of the smaller diameter classes, most of which are bunched in the lower half of sections 28 and 29, and the proportion of longleaf pine under merchantable size is somewhat smaller, but the yield per acre in board feet is very nearly the same.

Cutting has been confined to one or two small patches in the neighborhood of Pondville, where a little lumber is occasionally sawed for local use.

Table XXV gives the average stand per acre of the three pines on longleaf pine land, and of the three pines and the more important hardwoods on creek land.

TABLE XXV.—*Present stand on Block VI, Bibb County tract.*

Diameter breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 672.6 acres).			Creek land (average of 85.5 acres).							
	Long-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Lob-lolly pine.	Long-leaf pine.	Short-leaf pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1	0.87	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	1.64	.....	.....	.....	0.02	.....	.....	.....	.....	.....	.....
3	1.94	.....	.....	.....	.05	.....	.....	.....	.....	.....	.....
4	2.36	.....	.....	.....	.06	.....	.....	.....	.....	.....	.....
5	2.18	.....	.....	.....	.07	.....	.....	.....	.....	.....	.....
6	2.19	0.70	0.37	3.06	.06	0.06	.....	.....	.....	.....	.....
7	1.96	.61	.36	2.94	.09	.06	.....	.....	.....	.....	.....
8	1.92	.58	.29	2.39	.07	.....	.....	.....	.....	.....	.....
9	1.80	.46	.26	2.03	.08	.01	.....	.....	.....	.....	.....
10	1.90	.43	.25	1.81	.06	.02	0.15	0.23	0.62	0.19	2.45
11	1.57	.34	.17	1.35	.03	.01	.15	.27	.62	.20	2.06
12	1.96	.32	.15	1.55	.09	.02	.16	.26	.50	.09	1.81
13	1.59	.21	.11	1.03	.06	.02	.12	.23	.29	.09	.98
14	1.69	.22	.07	1.12	.06	.....	.03	.19	.33	.08	.83
15	1.74	.22	.08	.90	.06	.....	.09	.12	.22	.06	.72
16	1.62	.17	.04	.77	.07	.....	.08	.08	.12	.13	.43
17	1.58	.11	.06	.58	.09	.02	.05	.10	.12	.02	.34
18	1.65	.11	.06	.53	.06	.01	.03	.05	.06	.01	.28
19	1.50	.05	.03	.48	.02	.01	.02	.06	.14	.08	.15
20	1.51	.04	.04	.48	.07	.....	.03	.05	.06	.06	.14
21	1.35	.04	.02	.26	.05	.01	.05	.05	.06	.05	.09
22	1.38	.03	.03	.24	.05	.....	.06	.02	.02	.03	.09
23	1.17	.02	.01	.27	.06	.....	.02	.....	.08	.03	.05
24	1.06	.02	.01	.20	.05	.....	.....	.....	.....	.03	.03
25	.94	.01	.01	.20	.08	.01	.01	.01	.02	.03	.05
26	.68	.01	.01	.10	.01	.....	.01	.....	.....	.02	.01
27	.60	.01	.01	.12	.03	.01	.01	.....	.01	.02	.01
28	.49	.01	.01	.12	.02	.....	.01	.....	.....	.02	.....
29	.36	.....	.....	.02	.01	.....	.....	.01	.....	.05	.....
30	.28	.....	.....	.10	.06	.....	.....	.....	.....	.03	.01
31	.22	.01	.....	.06	.01	.....	.01	.....	.....	.02	.01
32	.14	.....	.....	.08	.01	.....	.....	.....	.01	.01	.....
33	.11	.....	.....	.03	.03	.....	.....	.01	.....	.....	.....
34	.05	.....	.....	.02	.01	.01	.....	.....	.....	.....	.....
35	.03	.....	.....	.03	.....	.....	.....	.....	.....	.....	.....
36	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
37	.01	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
38	.02	.....	.....	.01	.....	.....	.....	.....	.....	.....	.....
39	.01	.....	.....	.01	.....	.....	.....	.....	.....	.....	.....
40	.01	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.	44.09	.....	.....	.....	1.65	.....	.....	.....	.....	.....	.....
TREES 10 INCHES AND OVER IN DIAMETER BREASTHIGH.											
Total.	27.23	2.38	1.17	12.49	1.15	0.15	1.09	1.74	3.28	1.35	10.54
Per cent.	88.47	7.73	3.80	39.29	3.62	.47	3.43	5.47	10.32	4.25	33.15

The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches in diameter breasthigh	127,673,000
Cutting to a limit of 14 inches in diameter breasthigh	123,437,000
Cutting to a limit of 16 inches in diameter breasthigh	120,279,000
Cutting to a limit of 18 inches in diameter breasthigh	106,735,000

The average yield per acre of each pine on each type may be found in Tables XXVII and XXVIII.

Block VII comprises sections 25, 26, 27, 34, 35, and 36 of T. 22 N., R. 7 E., and sections 19, 20, 29, 30, 31, and 32 of T. 22 N., R. 8 E. Its area is divided into:

	Acres.	Per cent.
Longleaf pine land	6,093	80.2
Creek land	679	9.0
Unwooded land	823	10.8
Total	7,595	100.0

In the western part of the block, namely, in sections 27 and 34, the proportion of loblolly, shortleaf, and hardwoods in the mixture is large. In the other sections, however, the stand on the longleaf pine land was practically pure longleaf, but the northern part of the block comprises the 2,500 acres on which the timber was destroyed by the big hurricane of 1886, so that the average stand and yield per acre of merchantable trees for the whole block is considerably less than for other parts of the tract, with the exception of Blocks I and IV.

Although there has been no lumbering, there has been a good deal of boxing in sections 29 and 32, township 22 north, range 8 east, and much fine timber has been badly injured and will undoubtedly be burned or blown down long before the time comes for cutting it.

Table XXVI gives the average stand per acre of the three pines on longleaf pine land, and of the three pines and the more important hardwoods on creek land.

TABLE XXVI.—*Present stand on Block VII, Bibb County tract.*

Diameter breast-high.	Number of trees per acre.										
	Longleaf pine land (average of 308 acres).			Creek land (average of 36 acres).							
	Long-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Lob-lolly pine.	Short-leaf pine.	Long-leaf pine.	White oaks.	Black oaks.	Red gum.	Yel-low pop-lar.	Other hard-woods.
Inches.											
1	4.94					0.06					
2	3.68										
3	3.07					.03					
4	3.34					.03					
5	3.04					.19					
6	2.56	1.28	1.18	5.25	0.22	.08					
7	2.27	1.22	.88	4.67	.28	.11					
8	2.04	.91	.73	4.03	.14	.06					
9	1.23	.73	.59	2.97	.14	.03					
10	1.94	.71	.49	3.11	.22	.08	0.33	0.61	0.94	0.28	2.22
11	1.41	.68	.38	2.33	.14		.25	.58	.64	.31	1.92
12	1.73	.56	.22	1.14	.06	.03	.22	.44	.36	.44	1.25
13	1.63	.49	.13	1.61	.08	.03	.22	.39	.25	.17	.89
14	1.58	.37	.15	1.17		.03	.22	.47	.36	.14	.67
15	1.43	.32	.10	1.28	.11		.28	.19	.19	.17	.58
16	1.49	.23	.06	.86	.03	.06	.17	.19	.14	.28	.44
17	1.37	.20	.03	.67	.06	.03	.14		.11	.14	.14
18	1.54	.19	.04	.64	.03		.22	.14		.06	.28
19	1.09	.08	.03	.64		.03	.03	.06	.11	.08	.17
20	.99	.08	.02	.36	.03	.06	.06	.03	.11	.11	.14
21	.93	.06	.03	.53	.03		.06	.06	.03	.06	.08
22	.97	.02	.02	.36		.03	.06	.03		.03	.06
23	.90	.02	.02	.11	.03	.03	.06	.06	.03	.06	.03
24	.77	.02	.01	.17			.08	.06			
25	.62	.01	.02	.08	.06		.06	.03	.03		
26	.52		.01	.14		.03	.08		.03	.03	.03
27	.37	.01		.08	.06					.03	
28	.42			.03		.03					
29	.27	.01	.01	.06		.03					
30	.19			.14							
31	.13			.06							
32	.09			.03							
33	.06			.06	.03						
34	.04										
35	.03									.03	
36	.01										
37	.01										
38											
39											
40						.03					
44				.03							
Total.	48.70					1.12					
TREES 10 INCHES AND OVER IN DIAMETER BREASTHIGH.											
Total.	22.53	4.06	1.77	15.69	0.97	0.53	2.54	3.34	3.33	2.42	8.90
Per cent.	79.44	14.32	6.24	41.50	2.57	1.41	6.73	8.85	8.83	6.42	23.59

The total yield of the three pines on the whole of this block is:

	Board feet.
Cutting to a limit of 12 inches in diameter breasthigh..	44,692,000
Cutting to a limit of 14 inches in diameter breasthigh..	42,584,000
Cutting to a limit of 16 inches in diameter breasthigh..	39,421,000
Cutting to a limit of 18 inches in diameter breasthigh..	35,352,000

The average yield per acre of each pine on each type may be found in Tables XXVII and XXVIII.

TABLE XXVII.—*Present yield on longleaf pine land. Bibb County tract.*

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 12 INCHES.

Number of block.	Area.	Longleaf pine.		Shortleaf pine.		Loblolly pine.	
		Average yield per acre.	Total yield.	Average yield per acre.	Total yield.	Average yield per acre.	Total yield.
	Acres.	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*
I	2,565	2,814	7,217,910	1,043	2,675,295	833	2,136,645
II	5,293	7,392	39,125,856	88	465,784	149	788,657
III	6,832	7,822	53,439,904	247	1,687,504	266	1,817,312
IV	2,713	4,683	12,704,979	303	822,039	736	1,996,768
V	18,279	8,864	162,025,056	144	2,632,176	242	4,423,518
VI	13,384	8,718	116,681,712	160	2,141,440	279	3,734,136
VII	6,093	6,469	39,415,617	167	1,017,531	393	2,394,549
Total	55,159	7,807	430,611,034	207	11,441,769	313	17,291,585
CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 14 INCHES.							
I	2,565	2,742	7,033,230	933	2,393,145	671	1,721,115
II	5,293	7,158	37,887,294	79	418,147	125	661,625
III	6,832	7,585	51,820,720	223	1,523,536	233	1,591,856
IV	2,713	4,462	12,105,406	263	713,519	561	1,521,993
V	18,279	8,533	155,974,707	133	2,431,107	199	3,637,521
VI	13,384	8,475	113,429,400	142	1,900,528	246	3,292,464
VII	6,093	6,235	37,989,855	144	877,392	326	1,986,318
Total	55,159	7,546	416,240,612	186	10,257,374	261	14,412,292
CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 16 INCHES.							
I	2,565	2,605	6,681,825	811	2,080,215	516	1,323,540
II	5,293	6,640	35,145,520	67	354,631	101	534,593
III	6,832	7,126	48,684,832	191	1,304,912	209	1,427,888
IV	2,713	4,100	11,123,300	225	610,425	395	1,071,635
V	18,279	7,961	145,519,119	122	2,230,038	151	2,760,129
VI	13,384	8,338	111,595,792	123	1,646,232	197	2,636,648
VII	6,093	5,855	35,674,515	113	688,509	250	1,523,250
Total	55,159	7,151	394,424,903	162	8,914,962	204	11,277,683
CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 18 INCHES.							
I	2,565	2,449	6,281,685	719	1,844,235	402	1,031,130
II	5,293	6,178	32,700,154	55	291,115	78	412,854
III	6,832	6,517	44,524,144	168	1,147,776	187	1,277,584
IV	2,713	3,540	9,604,020	179	485,627	289	784,057
V	18,279	7,194	131,499,126	108	1,974,132	113	2,065,527
VI	13,384	7,429	99,429,736	104	1,391,936	148	1,980,832
VII	6,093	5,314	32,378,202	96	584,928	174	1,060,182
Total	55,159	6,462	356,417,067	140	7,719,749	156	8,612,166

TABLE XXVIII.—*Present yield on creek land, Bibb County tract.*

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 12 INCHES.

Number of block.	Area.	Longleaf pine.		Shortleaf pine.		Loblolly pine.	
		Average yield per acre.	Total yield.	Average yield per acre.	Total yield.	Average yield per acre.	Total yield.
	Acres.	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*
I	191	298	56,918	170	32,470	2,776	530,216
II	386	181	69,866	155	59,830	2,777	1,071,922
III	816	304	248,064	210	171,360	2,843	2,319,888
IV	783	34	26,622	46	36,018	2,589	2,027,187
V	3,052	653	1,992,956	89	271,628	3,361	10,257,772
VI	1,733	466	807,578	46	79,718	2,440	4,228,520
VII	679	164	111,356	221	150,059	2,360	1,602,440
Total	7,640	434	3,313,360	105	801,083	2,885	22,037,945

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 14 INCHES.

I	191	292	55,772	170	32,470	2,583	493,353
II	386	174	67,164	144	55,584	2,686	1,036,796
III	816	296	241,536	201	164,016	2,715	2,215,440
IV	783	29	22,707	44	34,452	2,423	1,897,209
V	3,052	639	1,950,228	84	256,368	3,180	9,705,360
VI	1,733	456	790,248	43	74,519	2,279	3,949,507
VII	679	160	108,640	211	143,269	2,178	1,478,862
Total	7,640	424	3,236,295	100	760,678	2,719	20,776,527

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 16 INCHES.

I	191	292	55,772	154	29,414	2,555	488,005
II	386	167	64,462	113	43,618	2,548	983,528
III	816	276	225,216	194	158,304	2,527	2,062,032
IV	783	29	22,707	41	32,103	2,183	1,709,289
V	3,052	619	1,889,188	74	225,848	2,941	8,975,932
VI	1,733	440	762,520	43	74,519	2,056	3,563,048
VII	679	157	106,603	195	132,405	1,908	1,295,532
Total	7,640	409	3,126,468	91	696,211	2,497	19,077,366

CUTTING TO A BREASTHIGH DIAMETER LIMIT OF 18 INCHES.

I	191	262	50,042	129	24,639	2,377	454,007
II	386	167	64,462	99	38,214	2,354	908,644
III	816	257	209,712	171	139,536	2,260	1,844,160
IV	783	25	19,575	26	20,358	1,959	1,533,897
V	3,052	598	1,825,096	72	219,744	2,623	8,005,396
VI	1,733	410	710,530	39	67,587	1,820	3,154,060
VII	679	140	95,060	177	120,183	1,640	1,113,560
Total	7,640	389	2,974,477	82	630,261	2,227	17,013,724

Damage to the Forest.

The forest has suffered from grazing and fires in the usual way.

FIRES.

To the standing timber and the reproduction fires have here wrought fully as much injury as on the Coosa County tract. (See Pl. III, fig. 2.) To the soil they have done even more damage. This is so light and loose and erodes so easily when exposed to the weather that the destruction of the ground cover by repeated fires has resulted in the serious denudation and gullying of the steep slopes. The sand thus washed from the longleaf pine land is deposited in the bottoms of the valleys. In many parts of the creek land these steadily increasing accumulations of sand are gradually changing the character of the growth. In places where the soil was formerly a deep, wet muck, upon which dense cane thickets flourished, the creeping in of the sand has smothered out the cane and made the conditions favorable to the growth of trees. Dense groves of red gum and magnolia saplings and poles grow in places where years ago, according to old settlers, there was nothing but a dense canebrake.

GRAZING.

The three counties in which the tract is located have passed no stock law, and cattle, sheep, and hogs still have free run of the woods. In consequence the range is heavily overstocked, is extremely poor, and has no chance to recuperate.

WINDFALL.

The region in which this tract is situated is often visited by tornadoes, from which the forest has suffered considerably. The damage is most common on the tops of high ridges where the tornadoes have dropped just long enough to uproot or twist off the trees on a small area of an acre or two, and have then risen again and passed on. Occasionally, however, a tornado will travel close to the ground for a distance of several miles, leaving behind it a broad path through the forest in which all the timber has been uprooted or broken off. The most noteworthy example of this was the hurricane of 1886, which first hit the tract in section 27 of township 22 north, range 7 east, and, traveling in an east-northeast direction, passed out of the tract at the eastern edge of sections 20 and 29 of township 22 north, range 8 east. The strip swept by the wind was at first half a mile in width, but as it advanced it gradually widened out until where it left the tract it was nearly a mile and a quarter wide. Throughout this path of over 2,500 acres practically every stick of timber was destroyed. Owing to the prevalence of fires and the dearth of seed trees there has been little reproduction on the area during the intervening eighteen

years. Saplings of longleaf pine are confined to a few small, scattered groups. Dense thickets of scrubby hardwoods, oaks, hickories, etc., have sprung up on the greater part of the strip, but on a large area the ground as yet is covered only by a thin growth of grass and the few charred remnants of the former forest.

Recently there has been some damage from wind in the extreme northeastern corner of township 23 north, range 7 east, and the adjacent sections of the contiguous townships.

INSECTS.

Insects have injured the forest in the same way and to the same slight extent that they have in Coosa County.

LUMBERING.

Along the line of the Mobile and Ohio Railroad logging has been going on ever since the line was put through, some eight years ago. In sections 1 to 6 of township 23 north, range 7 east, the longleaf pine has been largely removed. These sections were in consequence not surveyed. In some instances the cutting extends south into the next row of sections. In section 11 nearly all of the pine over 15 inches in diameter breasthigh has been taken out, and in sections 9 and 10 some cutting has been done in five widely separated forties which do not belong to the company.

In sections 1 and 12 of township 23 north, range 7 east, and sections 6, 7, and 18 of township 23 north, range 8 east, tie timber is being cut and hauled to the railroad from a few small private holdings.

In the neighborhood of Pondville post-office, in sections 6 and 7 of township 23 north, range 8 east, there are some small patches from which the best timber has been culled.

On the rest of the tract no logging has been done.

TURPENTINING.

In the southern half of township 23 north, range 6 east, many of the settlers have boxed their holdings for turpentine, and this boxing and succeeding fires have pretty well destroyed what small amount of longleaf pine they owned. On the private holdings of sections 29, 30, 31, and 32 of township 22 north, range 8 east, much of the timber has been boxed and will soon be killed by fire.

THE PRESENT CROP.

As stated before, cutting on the Bibb County tract will probably not begin until the lumbering on the Coosa County holdings is finished. At present the tract is in charge of one man, whose business it is to

look out for chances to increase the acreage of the tract by purchase and to protect the property from trespass.

As there is no stock law in any of the counties in which the tract is located, and as everybody is allowed by law free access to any and all unfenced land for the purpose of ranging cattle, sheep, or hogs, the only act which constitutes trespass on forest land is the cutting and removal of timber. The company has made no attempt to protect its land from fires, but has rather encouraged them on the theory that repeated annual burnings prevent an accumulation of combustible material which would afford fuel for fires large enough to harm the timber. When it is time to begin lumbering the plan is to construct a railroad leading from Moundville, on the Alabama Great Southern Railroad, up the valley of Elliott Creek, and, following the general course of the Moundville-Centerville public road, to cross the low divide to Little Sandy Creek and to terminate on Little Sandy Creek in section 15 of township 23 north, range 7 east, where a mill will be erected.

The Second Crop.

ESTIMATES OF FUTURE YIELD.

Estimates of future yield have been confined, as on the Coosa County tract, to the longleaf pine on the longleaf pine land. The results given in Table XXIX were computed from an average acre for Blocks II, III, V, and VI, on which the combined area of longleaf pine land is 43,778 acres, or 79.1 per cent of the total area of the four blocks.

Blocks I and IV have been left out of the calculation, because the stand on them is largely composed of loblolly and shortleaf pine, and the silvical problem involved is distinct from that of the rest of the tract. It is a question of raising a second crop of loblolly and shortleaf pine rather than one of longleaf. As no particular study has been made on the Kaul lands of the habits or rate of growth of these two species, and as the Kaul Lumber Company is not especially interested in them, it has been thought best to leave Blocks I and IV out of consideration.

Block VII has not been included in the calculations for the reason that its stand is so irregular. On 2,500 acres, or over 30 per cent of the area, the forest has been entirely destroyed, and owing to the prevention of reproduction by fires there will not be a second crop of merchantable size within a reasonable period. In other parts of the block the timber has been so injured by boxing that there are no trees which can be relied upon to serve as a basis for a second crop, or else the forest is similar in character to the forest of Blocks I and IV. Those parts on which there is a basis for a second crop of longleaf pine can be included under the recommendations given for Blocks II, III, V, and VI.

From an examination of Table XXIX it can be seen that although the present yield per acre on Blocks II, III, V, and VI is considerably higher than that of the Coosa County tract, the second crop promises to be somewhat lower. Cutting to a 16-inch diameter limit, the present yield will amount to 7,646 feet, and at the end of 30 years a second yield of 2,615 feet can be obtained. Cutting to an 18-inch diameter limit, the present yield is 7,176 feet, and the future yield, at the end of 20 and 30 years, respectively, will be 2,829 feet and 3,645 feet. This difference in proportion between present and future yields is of course readily explained by the fact that the composition of the forest is different. There are more trees over and fewer trees under 12 inches in diameter breasthigh on the Bibb County tract than in Coosa County.

TABLE XXIX.—*Future yields of longleaf pine on longleaf pine land, Blocks II, III, V, and VI, Bibb County tract.*

Cutting limit, diameter breast-high.	Average present yield per acre.	Average yield per acre, cutting to 12 inches in diameter breast-high, obtainable at the end of—		
		20 years.	30 years.	40 years.
Inches.	*Board feet.*	*Board feet.*	*Board feet.*	*Board feet.*
12	8,421	508	970	1,642
14	8,141	1,141	1,733	2,547
16	7,646	1,884	2,615	3,690
18	7,176	2,829	3,745	5,031

INTEREST RETURNS.

In spite of the slightly lower yield in board feet to be expected in the second crop, the returns on the investment at compound interest are very nearly the same as those estimated on a second crop on the Coosa County tract. The results of the financial calculations given in Table XXX show that a cutting limit of 18 inches in diameter breast-high will give the best returns.

TABLE XXX.—*Value of cut-over longleaf pine land as an investment, Blocks II, III, V, and VI, Bibb County tract.*

Present cutting limit, diameter breast-high.	Merchantable timber left standing.		Stumpage per M board feet.	Future yields and rate of interest on capital invested.					
				After 20 years.			After 30 years.		
Inches.	*Board feet.*	*Value.*		*Board ft.*	*Value.*	*Interest, per cent.*	*Board ft.*	*Value.*	*Interest, per cent.*
16	775	$1.74	$2.25 5.00	.....	....	....	2,615	$5.88 13.08	2 5¼
18	1,245	2.80	2.25 5.00	2,829	$6.37 14.15	2¼ 6¼	3,745	8.43 18.73	2¼ 5

RECOMMENDATIONS FOR CUTTING.

The general recommendations and rules for cutting in Coosa County hold good for the Bibb County tract, but the work of carrying them out will be somewhat more difficult. Owing to the smaller proportion of the lower-diameter classes in this tract there will be fewer cases where it will be advisable to lower the cutting limit and more cases where, in order to leave a satisfactory basis for a second crop, the cutting limit will have to be raised. The great prevalence of redheart and damage from windfall will often make it necessary to cut much below the limit in order to get rid of all defective trees.

The area on which the composition of the forest is such that the given limit of 18 inches can be strictly adhered to is comparatively small. The tendency will be to cut too heavily. In order to leave a sufficient basis for a second crop without unduly curtailing the present yield it will be necessary in selecting trees for cutting to exercise even more care and judgment than on the Coosa County tract.

A THIRD CROP—FIRE PROTECTION.

To obtain a reproduction of the longleaf pine as a basis for a third crop under the present conditions is impossible. If, however, the public range were abolished and the interior holdings were bought up, the expense of protection could be brought within reasonable limits and the production of a third crop would be as feasible here as on the Coosa County tract.

The fact that there is no stock law on this tract and that in the improvement to the grazing the owners of the interior holdings have an actual incentive to fire the woods renders the task of fire protection difficult and expensive. Under present conditions the cost is absolutely prohibitive.

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KAUL LUMBER CO. TRACT

BIBB, HALE AND PERRY COUNTIES

ALABAMA

LEGEND

- Longleaf pine land
- Creek land
- Not timbered
- —V— Block line and number

SCALE

CHAINS 80 0 1 MILE

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KAUL LUMBER CO. TRACT

COOSA COUNTY

ALABAMA

T.24N.R.18E.

T.24N.R.17E.

T.23N.R.17E.

LEGEND

- Longleaf Pine Land
- Creek Land
- Not Timbered
- V —·— Block Line and Number

Scale

Chains 80 — 0 — 1 Mile

Peckerwood Creek

Looney

Old Sawmill

Hollyspring Church

Smith

Sawmill

Kaul Logging Camp

KAUL LOGGING R.R.

TO SYLACAUGA

TO OVERBROOK

TO HOLLINS

Weogufka Creek

Deason

Honeycutt

Church

Paint Creek

Morris Mill

Joiner's Sawmill

Livecoak

Walker's Sawmill

Vann

Shield

Taylor

Blankenship

Prater's Sawmill

Turpentine Camp

McCutcheon

Leslie

Gold Branch

Gin

Old Sawmill

McGowan

Bell

Duke

Church

Vance

Clay Creek

Fivemile Creek

Weogufka Creek

I

II

III

IV

V

VI

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